THE

Journal of the American Medical Association.

EDITED FOR THE ASSOCIATION BY N. S. DAVIS.

PUBLISHED WEEKLY.

VOL. XI. CHICAGO, AUGUST 4, 1888. No. 5.

ORIGINAL ARTICLES.

FOOD AS A CAUSE AND CURE OF DISEASES OF THE NERVOUS SYSTEM.

Read in the Section on Practical Medicine, at the Thirty-ninth Annual Meeting of the American Medical Association, May, 1888.

BY EPHRAIM CUTTER, M.D., LL.D., HON. F.S.Sc., LOND.

OF NEW YORK CITY.

The aim of this paper is simply to tell how, when I was anxious to be set right, it was done. This was one of the tasks set me by my father, the late Dr. Benjamin Cutter, before I entered upon the study of the profession, when I asked to study the causes of disease. Were he living now, after the lapse of about thirty-five years, he would rejoice in the progress made, and if any advantage is derived from this presentation, it is due to his wise advice expressing medical agnosticism as to the causes of diseases of the nervous system.

Food as a Cause and Cure of the Neuroses.—This may seem paradoxical. A knife carves your dinner and cuts your throat. Water is essential to life and health, but to hold a man under it for five minutes is unhealthy. Fire cooks our meals and burns our houses. Without food, life ceases; but food produces colic, convulsions, fatty degeneration of tissues, numbness, paralysis, locomotor ataxia, impaired intellect, etc., sometimes death. On the other hand, food may be used to restore health to the nervous system.

To be sure, the nerves are implicated more or less in all diseases, as they pervade every organ, even the teeth, and without them there is no life. Food is just as pervasive. It enters into the treatment of all diseases and surgical affections. No food, no life.

The following diseases, in my opinion, are a good deal neurotic, though not so understood:

1. Consumption of the lungs is partial paralysis and interstitial death. The paralysis arises mainly from the carbonic acid in the intestines, which paralyzes the epithelia of the intestinal walls and makes them admit things into the blood they were meant to keep out. The food fermentation produces the gas.

2. Chronic diarrhœa or consumption of the bowels is also one form of the above. The colloid masses of sticky, adhesive and gelatinous mucus come from partially paralyzed mucous cells, and just the same in

3. Goitre, ovarian tumors, etc.

4. Neurasthenia in men is a paralytic disease induced by a catarrh of the spermatic and prostatic ducts caused primarily by fermenting food.

5. Pharyngitis sicca and many of the throat affections are due to improper feeding.

6. Constipation, I think, is often due to a lack of nerve force in the food, etc.

Our subject is limited to special feeding and their neurotic results. These are practical clinical questions. They can be studied by physicians on their own persons, and there is no difficulty in practically verifying the statements to be made. If any choose not to accept these dicta, it is asked that they will not reject them before thorough personal tests are made; as farmers test agricultural questions on their own farms. Several sets of evidence should be had; so if several gentlemen conclude to make tests, they should combine their evidence and base the final decision on the sum of their evidence.

To be more particular, what affections of the nervous system do baked beans produce? I think it best to quote from a work in which the subject is fully reported,[1] (see note), which I endorse, and which may be referred to by those that wish to explore a mine of invaluable research as to foods.

The author in 1854 fed on baked beans and coffee exclusively—in sedentary life. In three days his head was dizzy, his ears rang, his limbs prickled, and he was wholly unfitted for any mental effort. There were other important clinical results, but only the neurotic will be given in this paper. In 1856 he repeated the experiments on himself associated with six well and hearty men—laborers, selected from about 100 subjects—hired to live with him on this diet, in sedentary life. The following are the symptoms affecting the nervous system: Diet, baked beans and coffee at meals; cold water midway between meals. *Résumé* by days for brevity.

Third day. Colic in three men; ears ring and dizzy in two; head swims in one.

[1] NOTE. "The Relation of Alimentation to Disease." By J. H. Salisbury, M.D., LL.D. New York: J. H. Vail & Co., 1888.

Fourth day. Ears ring, dizzy, colic, heads swim.

Fifth day. Ears ring, all; colic, five; bewildered and confused, three.

Sixth day. Colic, five; ears ring, five; dizzy, five.

Seventh day. All dizzy and ears ring. Deafness in one. Confused and bewildered, five.

Eighth day. Hands and feet prickle; feel strangely and confused.

Ninth day. Hands and feet prickle; bewildered.

Tenth day. Hands and feet numb; dizzy.

Eleventh day. Heads feel empty, eyes staring. Strange, much bewildered, ears ring.

Twelfth day. Walk as if intoxicated. Head numb and vacant; feel lost; feet and hands prickle.

Thirteenth day. Hands numb. Reel in walking. Gait unsteady; feel weak and exhausted, forgetful and feel strangely; legs and feet numb; feel drunk.

Fourteenth day. Feel intoxicated. Legs and feet numb. Ears ring, dizzy, head vacant, eyes staring; numb, reel in walking, gait unsteady.

Fifteenth day. Walk with difficulty, feel drunk and lost. Hands and feet prickle, stagger in walking, feel light-headed.

Sixteenth day. Ears ring. Bewildered, eyes vacant, head dizzy. Tired and strange; feet drag; hips, feet and legs numb.

Seventeenth day. Feet and hands prickle; legs and feet numb; gait unsteady. Feel very weak and bewildered, reel in walking, feet drag in walking; eyes vacant and glaring.

Eighteenth day. Walk with difficulty. Weak and smothering feeling at times; cannot walk straight; feel as if they could not breathe freely, heart palpitates on exertion. Nervous; feet drag in walking; heart pains.

Nineteenth day. Experiments suspended, as men were so forlorn and dilapidated.

Cure.—These cases were all cured in four days by a diet of broiled lean beefsteak freed from fat and white fibrous tissue and seasoned with butter, pepper and salt; clear tea and coffee for drinks. This was because the symptoms were acute.

Oat-Meal.—Four well men, laborers, while in sedentary life, lived on oat-meal porridge seasoned with butter, pepper and salt, cold water for drinks between meals, coffee with sugar and milk at meals. To save space this is given as one report. 1857. Nervous symptoms found:

Third day. A dull, heavy feeling for all.

Fourth day. Slight colic.

Eighth day. Head dull, aching, dizzy. Colic; bewildered; ears ring.

Ninth day. Feet prickle. Ears sing.

Tenth day. Dull and stupid, dizzy, headache, colic, feet and hands prickle, abdomen lame as if bruised, pain in back, feet and hands prickle.

Eleventh day. Pain in head, ears ring; limbs heavy; stupid and dull. Breathing oppressed on exertion. Head dizzy and mixed, memory poor; lazy.

Twelfth day. Cardialgia. Feet cold; forgetful; colic; head confused; feet and hands prickle; back weak; singing in ears. One thinks he is getting crazy. Feet and hands partially numb.

Thirteenth day. One thinks he is losing his mind. A choky feeling while swallowing. Awoke very tired, head mixed, feet and hands numb, heart irregular.

Fourteenth day. Sleep heavy and bad dreams. Head bewildered, hands and feet prickle, nightmare, reels in walking, back aches, unsteady in walking.

Fifteenth day. Bad dreams, stupid on rising. Ears ring; forgetful. Legs not under perfect control, unsteady in walking. Stupid; sleep disturbed.

Sixteenth to twenty-fourth day. Head more mixed and confused, eyes blur in reading. One "feels as if his mind was giving way." Frightful dreams, colic pains, numbness and weight in limbs, eyesight growing dim, neuralgia all over. One sometimes sees double. Some imagine they see snakes, devils and bad characters. Talk in sleep; loss of control of limbs.

Twenty-fifth and twenty-sixth days. Memory poor, deaf, head confused, heavy, obtuse, lower extremities numb and clumsy. One reels in walking, soles feel cushioned; memory poor.

Twenty-seventh day. Voice weak and husky; legs and feet numb; head dizzy and mixed. Confused; eyes wild and staring; cushioned soles; sciatic pains; backs ache; hearing impaired; legs numb and clumsy.

Twenty-eighth and twenty-ninth days. All these symptoms aggravated.

Thirtieth day. Stopped experiments for prudence's sake.

Thirty-first to thirty-fourth days. Cured by feeding on broiled beefsteak, tea and coffee.

Besides these our author experimented similarly with bread, rice, wheaten grits, hominy, tapioca, sago, potatoes, green peas, string beans, green corn, beets, turnips, squash, asparagus, vinegar in excess and the various meats, on four to six men in groups, at times lasting seven to forty-five days. The results in all cases were recorded and tabulated as in the bean and oat-meal experiments. He says, page 207, lines 9–16: "To go through all my food experiments in detail would make this treatise far too voluminous to be read and studied, except as a work of reference. This would defeat my desire of getting it into the hands of as many students as possible in the opening of their career, directing their attention, as well as that of all earnest thinkers, whether in the profession or out of it, to the urgent necessity of dietetic reform, and to the real nature of most of our dis-

eases, based as they are upon departures from dietetic laws indicated by the organic structure of man."

Of the meats—eggs, fish, pork, veal, chickens, turkeys and game, after a limited time produced more or less distress about the stomach, much sickness and weakness, with great heat and bewilderment in the head. He calls this "meat dyspepsia."

He found that the vegetables, bread, rice, wheaten grits, hominy, sago, tapioca and potatoes were fed singly for forty to forty-five days before neuroses were caused, and hence are most desirable for neurotics.

The crowning result of his auto-aliotic experiments was that beef was the only food that adults could live on continuously for years—that beef cured all other neurotic symptoms developed in the healthy persons experimented on, in a short time; simply adding hot water to wash out the alimentary canal and keep up normal peristalsis, and prevent the lodging and consequent fermentation of the food therein. Please remember these were *acute* cases without organic lesions, and hence easy to cure by stopping the cause. Had they been chronic cases they would not have got well so soon.

For simplicity, thoroughness, positiveness, extent and practicability, these food experiments are in my opinion unparalleled. They are so simple that any one can verify them, as said before, and their intimate relation to the treatment of neuroses, to name no more, entitles them to the careful consideration of all who are concerned in any way with the practice of medicine. The details can be had.

The Relation of Albumen, Starch and Gum to the Neuroses.—In the Transactions of this Association for 1857, Dr. Wm. A. Hammond contributed a prize essay: "Experimental Researches Relative to the Nutritive Value and Physiological Effects of Albumen, Starch and Gum when used singly and exclusively as Food." Though the author used only himself for experimentation, still his results are in place here. He lived ten days on albumen obtained from the serum of bullock's blood boiled well and washed with water.

Third day. "In the evening I had slight pains in the lower part of the abdomen and quite severe headache. Both disappeared after the first passage from the bowels. My sleep was unquiet in the early part of the night and I awoke with headache."

Fourth day. Severe headache with fever. Feeling of debility in the system. Singular sinking sensation at the epigastrium; nausea. Pains in lower part of abdomen very severe.

Fifth day. Was quite restless in the night and felt chilly towards morning.

Sixth day. Increase of debility; headache and abdominal pain not present. Hard work to eat the albumen.

Seventh day. Weaker.

Ninth day. Sleep very unquiet.

Tenth day. Debility extreme, intellect somewhat confused, sleep restless. Experiment ceased. All bad results removed by "proper diet."

Corn Starch. Neurotic Symptoms.—Fourth day. Good deal of debility, mind inactive, great indisposition to physical exertion. Oppression about lungs relieved by long breaths. Dreams of falling from precipices frequent; awoke several times with a sudden start. Saliva thick and ropy.

Fifth day. Mind dull and it required an effort to fix it on any subject. Chest oppression increased, sighing respiration frequent, slight palpitation of the heart, pain in abdomen, flatus. Awoke with a most intense pain over left eye. Free giving of magnesia relieved it instantly, showing acidity of stomach as the cause.

Sixth day. Debility; torpor of bowels. Mental phenomena unchanged, chest oppression somewhat less, palpitation very annoying.

Seventh day. Palpitation very troublesome, debility excessive, specially in dorsal muscles. Awoke with severe headache; slept ill.

Eighth day. Violent headache all day; numb, somewhat confused, almost constant twitching of left upper eyelid which was very annoying. Griping pains in abdomen. Palpitation less violent and frequent.

Ninth day. Same as those of eighth day.

Tenth day. "The immediate effect of the slight abstraction of blood was to relieve the feeling of oppression at the chest, but in an hour it returned with increased violence. The debility was very great." Experiment ended. "Ordinary diet renewed with some degree of caution. After a few days I became free from all unpleasant symptoms and rapidly regained my usual good health."

Diet of Gum Arabic and Water Alone.—Experiments could not be continued over four days on account of the derangement of health.

First day. "I had severe colicky pains in the lower part of abdomen after eating the second meal of gum."

Second day. Good deal of debility, hunger and weakness soon after meals. Abdominal pains more severe after eating. Unpleasant dreams, disturbed sleep, severe headache on awaking.

Third day. Extreme debility and hunger; headache; obliged to lie down during afternoon; abdominal pains annoying. Restless at night, little sleep, awoke unrefreshed.

Fourth day. Hunger and debility great, severe abdominal pains for nearly twenty-four hours, tenderness of abdomen on pressure. Hunger not relieved by eating gum. All study omitted; physical exertion trifling; did not sleep well. Stopped experiment, unable to longer refrain from other food.

Fifth day. Great weight and pain in rectum. The writer says: "As an article of food for

the sick, gum arabic should be especially condemned." His closing paragraph is as follows: "In an essay of this character, whose chief aim is to add to the sum of knowledge, the labors of others could at most receive but a slight notice, and must of necessity frequently be passed over without even a word of recognition, yet no one appreciates more highly than myself the self-devotion and constant striving to enlarge the bounds of science which animate so many physiologists of the present day, and which have already yielded such brilliant results. Had I, however, attempted to do justice to even a tithe of their contributions, I should have converted this memoir into a treatise, and might have lost sight of all originality in my efforts to make successful compilation. With what success I have prosecuted these inquiries is not for me to determine. I cannot, however, think them valueless, for, if they only excite others throughout our land to investigate in living beings the operations of nature, they will still be beneficial to the cause of that science which constitutes the basis of all medical knowledge. From the united labors of those who seek by original investigation to build up a positive science, where there is yet so much darkness and uncertainty, what may we expect? May we not confidently look forward to the perfect enlightenment of our minds in regard to the most obscure of the vital processes? Though we may often be led astray by experiments conducted without due care, and with insufficient knowledge, they yet afford the only means by which we can successfully work out the sublime problems which the great Creator of all has prepared for our solution."

These researches accord with the practical idea that colic, headache, confused intellect, laziness, bad dreams, epilepsy, convulsions sometimes and other neuroses are connected with improper feeding, and cease when this cause is removed. Children have died from eating raisins, which proved too much of a digestive problem for the nervous system to solve, overwhelming it by its difficulties. But we wish to go a step further, and assert that affections of the nervous system depending on fatty degeneration and fibroid development have their primal cause in food, as pointed out by Salisbury (*loco citato*). Among them we name paralysis, partial or complete, hemiplegia, paraplegia, apoplexy, sclerosis, hyperæsthesia, anæsthesia, etc. Here there is structural change of the arteries or nerve sheaths, where normal tissues, as the muscular arterial coats, are replaced by fat or fatty deposits and a thickening of the fibrous tissues of the nerve sheath, to name no more. The arteries are weakened, yield to blood pressure and rupture, blood is poured out, pressing on the immediate neighboring structures and causing the paraplegia or hemiplegia, or instant death, according to where the pressure comes. The thickening of fibrous sheaths of nerves comes from a low vitality produced by food which does not have pabulum enough to make good tissue, or from fermentation producing the paralyzing gases of carbonic acid or sulphuretted hydrogen, etc. If one doubts he has only to inhale continuously either of the gases, cautiously, for death might ensue.

The effect of this paralyzing is to produce fatty degeneration by disuse — though it should be added that "fatty degeneration affords time for repentance and reform," and is a preservative process, as, without it, destruction would come sooner. All diseases of fatty degeneration besides those named—as Bright's disease of the kidneys, fatty liver, heart, lungs, etc., are intimately connected together as neuroses caused by paralyzing foods. This rather clashes with conventional terminology; but curing disease is more than terminology. As knowledge grows, nomenclatures are changed to accommodate the increase.

Sclerosis comes in the same category with goitre, ovarian and fibroid growths, outcomes of the growths of half-dead and semi-paralyzed tissues which are starved and numbed on improper alimentation. The cure lies in the food. The main element is having it well digested. Any food that is well digested by any person in health is a good food for that person, but any food that ferments into alcohol, carbonic acid gas, vinegar, sulphuretted hydrogen, etc., is not a good food for that individual. So, in affections of the nervous system, the main thing is to stop the causative foods and substitute those that will digest, and not paralyze the nerves (the glandular structures specially), and will furnish elements for new and healthy structures. Nature then cures. Medicines, baths, massage, etc., are the adjuvants and assistants to the *vis medicatrix naturæ* which runs the system and takes considerable time to repair the ill results of bad feeding which has been going on for many years.

Experiments with 1,028 hogs fed on sour distillery slop. (See "The Relation of Alimentation to Disease," *loco citato.*)

General Remarks.—In all the hogs experimented with, paralytic symptoms began soon after bloating and constipation till past the eighth week, when one-fourth were dead. By that time the others begin to eliminate the vinegar faster than it comes in.

Neurotic Symptoms: Gradual weakening of the limbs, labored breathing on moderate exertion; tendencies to stagger and reel. Often dragging hind legs and singing in the ears, shown by a frequent shaking of the head and lopping ears held the lower.

In 254 fatal cases, loss of control of all the hind parts so that they were often unable to walk or even stand without support.

1858, October 4, 624 hogs, healthy, fed on slop:

Thirteenth to Nineteenth days. Dizziness, ringing in ears, slight reeling in hind legs—in all.

Twentieth day. One hog refused to eat; was partially paralyzed, reeling in walking, nose to the floor, head held to one side and shaking it frequently. Indifferent. Partially deaf and blind. At 10 A.M. it fell over on its side. Surface became blue. Breathing short and labored. Died at 12 M.

October 22. Four hogs died to-day. Became cyanotic and very much oppressed for breath and paralyzed before death.

Case I.—Twelve hours before death ceased to eat, became listless, dumpish, and insensible to surrounding objects. Eyes dull, heavy and glassy. Staggered about. Soon the surface became blue, the hind parts paralyzed, and the animal unable to longer walk, fell over and died.

Case V.—Partially paralyzed at 8 A.M., Nov. 3. Died at 11 A.M. Meningeal vessels and sinuses gorged with blood but not connected with the paresis.

Case VI.—Died at 12 M., Nov. 3. Staggered as it walked for several hours before death. Reeling behind. Meningeal vessels and sinuses gorged with blood.

Case VIII.—Died Nov. 4, 8 A.M. Sluggish yesterday afternoon with nose to the floor. Reeling. Appeared blind and deaf. Brain congested highly. Meninges gorged with blood.

In one month 56 hogs died on slop feeding.

Case X.—Nov. 2, refused food, became listless, gradually more and more paralyzed, blind and deaf. Fell over and died suddenly at 1 P.M., Nov. 1. Brain and meninges congested with slight exudation of serum.

Case XI.—Nov. 3, P.M. Ceased to eat. Nose held to floor. Reeled in walking. Held head to one side with one ear lopped, often shaking the head. 12 M. fell over, and died at 3 P.M.

Case XVII.—Nov. 5, A.M. Early ceased to eat, became dumpish; nose to floor; reeled in walking; head held to one side; left ear lopped; shakes head frequently. 4 P.M., fell over on one side and began to twitch spasmodically with general tremor before death. Meningeal vessels gorged with clotted blood; embolism.

Case XXV.—Nov. 7, 10 A.M. Nose held to the floor; partially blind and deaf; reels in walking. 3 P.M. Unable to get up; lying on side. Brain and meninges congested with small quantity of serum.

Case XXVI.—Nov. 7, P.M. Unable to stand. Died in the night. Brain and membranes congested.

November 28, 154 hogs had died out of 624.

1858, October 25. Another lot of 404, making 1,028 in all, put on sour whisky slop from distillery:

Nov. 9-13. More or less dizzy; reeling in the walk sometimes and less ravenous for food. Four hogs so injured by fighting that they were slaughtered, leaving 400.

Case LIX.—Died suddenly by feed trough. Brain gorged with clotted blood, blood-vessels broken.

Case LX.—Nov. 19. Nose held to floor; reeled in walking for thirty-six hours. Partially deaf; blind and paralyzed in hind parts. Brain congested with bloody serum effused.

Case LXIX.—November 24. Paralyzed and unable to stand fourteen hours before death. Brain congested, and cranial cavity contained about one ounce of suffused serum.

Out of the 104 cases of autopsies, 72 had embolism of brain and 16 ruptured blood-vessels in brain.

The author ascribes the paralysis in all cases more or less severe to the absorption of carbonic acid gas with which the stomach and bowels were filled. (Koting, p. 290, paragraph 111, etc.) "The injurious effects of the acetic acid are increased by the gradual absorption of carbonic acid gas, with which the stomach and bowels are constantly filled. This gas slowly paralyzes the muscles, follicles and glands of the whole digestive apparatus, so that these surfaces, villi and follicles cease to have the selective power of health, through which to carry on the various normal physiological processes: deleterious products then effect an entrance together with the nutrition. This state being ushered in, diaphragm, heart, lungs, the whole organism in fact, begin to get more and more enervated. The action of the heart weakens, the extremities are colder, the breathing is more hurried and labored, the nerves of sense are more or less paralyzed; all of which aggravates the effects of the acetic acid by partially paralyzing the entire system and preventing such a rapid elimination of the acetic acid as might otherwise take place."

This is undoubtedly true. Embolism of the brain structures certainly affects the nervous system. It should be added that like cases of hogs were cured by feeding on sweet corn.

With this evidence this paper is closed showing how I have been set right. I can hardly express my delight which comes from the acquisition of this knowledge and the debt owed to the source of information. Doubters can easily verify the statements by living for sixteen days on baked beans alone. So long as there is no rebutting evidence these statements should stand accepted as the exponents of a higher and more practical plane of medical science than has yet been attained. The "capacity it gives to do good not only gives it a title to it but makes the doing of it a duty" (Duke of Brandenburg, 1691).

1730 Broadway, May 1, 1888.

DR. E. VON ERMENGEM has been appointed Professor of Hygiene and Bacteriology at Ghent.

INFANT FEEDING.

Read in the Section on Diseases of Children, at the Thirty-ninth Annual Meeting of the American Medical Association, May, 1888.

BY CHAS. WARRINGTON EARLE, M.D.,

PROFESSOR DISEASES OF CHILDREN, WOMAN'S MEDICAL COLLEGE, PROFESSOR OBSTETRICS, COLLEGE PHYSICIANS AND SURGEONS, CHICAGO.

As an introduction to what I have to say in regard to infant feeding it will be particularly appropriate to present to you a brief *résumé* of what Baginsky, the latest German author on "Kinderkrankheiten" writes on the subject.

It is appropriate, it appears to me, for several reasons: First, it gives to you the ideas of a leading advanced man on the subject, which is more than would come to you, perhaps, did I not quote from him. It presents to you, secondly, his conclusion in regard to the terrible mortality where a parent deprives her child of maternal nourishment, and also shows how much greater has been the effort with us to furnish a substitute for mothers' milk. Possibly this is to our discredit.

The greatest of mortalities in all times and among all nations is due to the lack of mothers' milk. In Berlin, one-half of all the children born out of wedlock die within six months, and during the summer months a very great number of all children succumb to errors of diet.

The question *par excellence*, rising above all others, is infant diet.

Next to mothers' milk comes the wet nurse.

Artificial foods are divided into two classes:

In the first group are enumerated,

Cows' milk,
Peptogenized milk,
Condensed milk,
Cream mixtures,
Liebig's foods.

While in group two are found the prepared foods.

The first class of artificial foods is substituted from the birth of the infant, while the second is particularly adapted to somewhat older children and may be given as adjuvants to mothers' or nurses' milk.

The difference between mothers' milk and cows' milk is given in general terms as follows: the water is about equal, caseine, albumen, salts and butter, a greater quantity in cows' milk, and of sugar less.

This analysis as regards the fats does not agree with the usual analyses. He also says that coagulation and fermentation arises sooner in cows' milk than in mothers'. According to Dogiel there is not as much difference between mothers' and cows' milk as has been formerly supposed. Out of cows' milk it is possible to manufacture a substitute which in almost every essential is equivalent to mothers' milk. The greatest difficulty is to obtain good cows' milk, and this is why condensed milk is frequently the best substitute which can be provided. Cows' milk if given to babies should not be administered raw, but boiled long and thoroughly in order to destroy bacteria. Germs of tuberculosis can be effectually destroyed if they exist in cows' milk, by thorough boiling. Soxhlet's cooking apparatus is spoken of as the best and safest to destroy the germs found in milk. By the use of this process cows' milk is much better as a child's food than we have formerly thought. On account of the protean substances, however, the milk should be diluted, and there should also be added a little milk sugar. The digestive powers in children are different. Some bear one thing well and another child something else better. One takes a great amount of fat and thrives, others demand less and if the same amount of fat is given, disease ensues. Cows' milk should usually be prepared in proportion of one to three for young children, later in equal parts. Some children at 9 months can take clear milk and digest it perfectly. A curious fact is developed in the dilution of cows' milk, in that from at first being one to three, this proportion is lessened about 15 per cent. during the first two months, and then increased until equal parts of water and cows' milk are used. Two methods of preserving milk are presented. First it is condensed with sugar, and the second without this ingredient. The great trouble in the condensing process is, that too much sugar makes it indigestible and if you take a milk of this kind and dilute it so that it can be digested it makes it too weak. Every can of condensed milk should be separately inspected.

Peptonizing food is not a new idea. It is very old and great difficulties have been found in bringing about the process, and it is not regarded with great favor by the authority from whom I am now quoting. Biedert's cream mixture contains no more than a single per cent. of caseine, and agrees excellently well in a large number of cases. Liebig's foods and soups are made from milk, wheat and malt, but it is believed that the cream mixture mentioned above, when fresh and properly made, is better than Liebig's food. Nestlé's food is spoken of as being the best type of a prepared food. It contains 40 per cent. of sugar, 5 of fat, 15 of protean compounds, and 30 per cent. of dextrine and amylum. It has been noticed that a long continuation of the administration of an artificial food, in some cases at least, brings about a change of blood. The red corpuscles diminish, but they can be increased if a wet nurse or mothers' milk is substituted.

This much for an introduction, and a statement of what is so greatly desired—a substitute for mothers' milk.

Some one of the old authors, whose name I cannot now give, has said that "Nature does not afford, nor can art supply a substitute for mothers' milk." With this I agree in every respect, and believe further, that as medical men our influence

and encouragement should always be given to mothers, unless some contra-indication exists, to nurse their babies.

We should also explain the dangers which children must pass through, particularly during the summer, and state plainly the probabilities that a certain number of them cannot survive upon any artificial food which may be devised or suggested. Practically, however, we know that in many cases our instructions cannot be carried into effect; that either from sickness, or previous hereditary disease, or from the death of the mother, a considerable number of babies must be, and are deprived of their natural alimentation. In addition to the above cogent reasons, we find a certain number of mothers who are robust and healthy and should nurse their own children, but are constantly finding excuses for not doing it; and either without the physician's consent or for some trivial reason, refuse to nurse their children, and force the issue of an artificial diet.

So firm is my belief that no artificial food can be selected which will furnish a proper nutriment through the hot months to a considerable number of these little people whose mothers cannot or will not nurse them, that I am every year coming to suggest with greater frequency a wet-nurse. I know full well what a wet-nurse in many families means. Many of them are conscientious, and do everything possible to nourish the little charges placed in their care, while others are totally irresponsible and corrupt in the extreme. If from any cause the mother cannot nurse her baby, and from certain other causes a wet-nurse cannot be provided, then, of course, either an entire or partial artificial diet must be provided. A *mixed* diet is preferable to an artificial one, that is, part mothers' or nurses' milk, with the remainder supplied from some outside source. A little mothers' milk for a sick day or while a tooth is erupting is most valuable.

At the first, then, we must acknowledge three facts.

1st. That mothers' milk is the food *par excellence* for a baby.

2d. If this cannot be furnished, in large cities at least, a wet-nurse should be procured.

3. If, for causes which I have now enumerated, the mother cannot supply the nourishment, and if from causes over which we have no control, a wet-nurse cannot be secured, an artificial diet must be furnished. And that if the mother or a wet-nurse can provide only part enough nourishment for the child, it is better to fill in with some of the substitutes, such as cream, cows' milk, or some of the prepared foods, than to try to bring up the child upon a strictly artificial food.

One of the first occasions at which we may be called to supply an artificial food for a baby comes in a case where a child is prematurely born. In part of these cases the milk secretion of the mother is at once established and the child is nourished from the very commencement with the food which its little non-developed digestive apparatus can best provide for; in others several weeks may elapse before the milk secretion is established, and during that time something must be provided for its nourishment. Several have already come under my care. I have notes at this moment of three infants born between the six and seventh months, where an artificial food from necessity, had to be provided. I have succeeded in saving these lives on an artificial food. Cream is the basis, barley-water the menstruum, to which is added a little salt, a little sugar of milk, and a small amount of lime-water.

A prematurely born baby should be fed a small quantity frequently. Sometimes not more than a half-teaspoonful, and when not fed from the spoon let an ordinary ounce bottle be provided with a rubber mouth-piece. I have no use for the large nursing bottle provided with glass and rubber tubings and brushes. I regard them, with all their appliances, particularly for a prematurely born child, a fraud and a snare. For the first few days, perhaps, cracker-water with a small amount of sugar of milk is all that is necessary. Then cream added to a little cracker-water, or cream and rice-water; then cream and barley-water, and if vomiting takes place, a small amount of lime-water should be added. If from any reason the cream does not agree with the baby, condensed milk with barley-water, a little salt, and possibly the addition of a little lime-water. By varying the amount of cream, using either barley-water or rice-water as the diluent, adding a little sugar of milk and a little grain of salt, and sometimes a little condensed milk, when from any cause the cream disagrees with the infant, one is able to carry along one of these puny children until such time as the milk secretion is established. At another place in this paper I shall have something more to say in regard to condensed milk.

OBJECTIONS TO CREAM FOODS.

In our large cities it is difficult to obtain pure cream, and it is more liable to changes than ordinary cows' milk. It is also possible that enough cream to nourish a child would be too fat for it to digest. As a matter of fact, however, we find cream does agree excellently well with a large number of children.

ARTIFICIAL FOODS.

Coming to consider the use of artificial foods, we should state in unmistaken terms to mothers that because one baby has been brought up on a given artificial food, it does not follow that the same food will agree with the next baby. One food nourishes a given baby well, but may, if administered persistently, kill the next baby.

The peculiarities, good and bad, of the different foods which I shall consider will be purely

from a clinical standpoint. The discussions regarding the chemical compositions and arrangements must come from the chemists themselves.

My trouble has been to find a food that would in the first place, agree with a baby, and secondly, that would nourish it.

Cows' milk will agree with some babies, but in many cases its administration is followed by vomiting and passing great masses of curds (caseine). Manufactured foods are frequently retained by the child, but he emaciates and many die from inanition.

Very early in my experience I began to detect a difference in foods. Some agreed with a young baby and would not nourish an older child; while other foods disagreed with a young infant, and furnished abundant nutriment to a child 10 or 12 months of age. Without investigating in a scientific manner the composition of these foods, I came to calling them young foods and old foods. Among the foods which I have found suitable for very young children, I would mention cream and barley first, cream and oatmeal water or rice water, condensed milk, with some restrictions, Nestlés' and Carnrick's foods and Malted Milk. I should not fail to speak of the white of egg as a substance very easily digested by children with weak stomachs, and which gives to them a very fair degree of nourishment. Then comes Mellin's food, Imperial Granum, and Ridges' food for older children. I speak of these foods after considerable study and rather extended experience with them, and do not place any as first, or in any degree a perfect food.

Let us examine the constituents of these foods, and point out their imperfections. It will be noticed that simply from experience I had at first selected a food with more fat—that is, cream and barley-water. Next came milk and Malted foods, and then for older children the farinaceous and Liebig's foods, Mellin's, Ridge's and Imperial Granum. It appears to me that there is good in all these foods, but the medical profession do not take sufficient pains to designate a food suitable for a young or older child. The matter is left too largely to the people, until a food of their selection has produced its deleterious effects, and then we are called, only to find a child emaciated, impoverished and with a digestive apparatus so thoroughly out of repair that the child dies before we can bring about a normal condition of digestion.

We must cease believing and acting on the belief that, because a baby is a little man that he needs the same food (as regards quality, and only less in quantity) that a man needs. And the dear people who are so quick to decide some of these questions which trouble us for years, should have alongside the motto "God Bless our Home," another—"Don't Starve the Baby."

COWS' MILK.

This is a perfect food for the adult. It has fat, albumen, carbo-hydrates, and salts, and the adult stomach generally digests it with ease, and it is capable of sustaining life for a long period.

It forms, however, very heavy, and dense curds, and in this respect is frequently extremely difficult to digest in a weak and undeveloped stomach.

It is also poor in fat, and with the objection urged above, namely: the tendency to form a hard, firm curd, in many cases comes to be, when used as a baby food, the exciting cause of many diseases, and remotely the food upon which emaciation, marasmus, and death ensue.

I do not know that our brethren in the country and small towns find these difficulties with the administration of cow's milk, but we do in the large cities. I do not deny that some children thrive on cow's milk; I grant this, but at the same time I do know that it kills others.

The milk from blooded cows supposed to be richer in fat has been tried, and in many cases works well, but in others has been a marked failure.

There is no reason why, however, when we know what the food the cow is fed upon, that she is in a clean stable, and care is taken with the milk and it agrees with the baby, that it should not be selected.

The index of good nutrition, whether the baby is on mother's milk, mixed food or artificial, is in its growth. To this end the child should be frequently weighed, and we should inspect its appearance, look at its fontanels, etc.

THE SO-CALLED MILK FOODS.

The best examples of so-called milk foods are Gerber's and Nestlé's. The first I have had very little experience with, but know that it has agreed excellently well with a few children.

Nestlé's food is made very much like it, and is with us a very popular food. Some Chicago druggists say that more Nestlé's food is sold than any other infant food on the market.

Condensed milk forms the basis of Nestlé's food. To this is added a certain amount of wheat flour and as stated by some, oatmeal. This substance is then made into biscuits, thoroughly cooked, ground minutely and mixed with the condensed milk. This is then dried by slow heat, ground, and sufficient wheat gluten is added to bring up the albuminoids to the same per cent. found in human milk. (Leeds.)

Whether this is the exact method of making this food we do not know, but we do know that all of these milk foods have a good per cent. of albuminoids, fats and salts, and that by baking, some of the starchy parts are converted into dextrine and are easily assimilated.

OBJECTIONS TO NESTLÉ'S FOOD.

It is claimed that a large part of the starch is not converted, and in none of these foods has the caseine of the milk been pre-digested, and the

character of the caseine is not at all changed. Notwithstanding this fact, we know that at the bedside Nestlé's food agrees with a very large number of children.

CONDENSED MILK.

I may remark in the beginning that the great trouble in the use of condensed milk is, that not enough is used. Every one should understand that milk is only condensed four times, and that a small amount will color a very large amount of water. The people do not understand this, and I am afraid that physicians do not take the trouble in many cases to investigate it. One teaspoonful of condensed milk will color twelve ounces of water, and I have known this to be given as a food to an infant. It is a starvation diet, and in the majority of cases sooner or later the child develops symptoms of bad nutrition.

In my experience the youngest infant will take condensed milk in the proportion of 1 to 10 or 15, that is, barley or rice water, 10 to 15 pts., condensed milk, 1 part, sugar of milk, salt and the phosphates. Even this will only be sufficient for a short time, and one must soon either add more condensed milk, or to the same food, cream. The agreement with each individual case, in less or increasing quantities, is the only safe rule for our guidance.

Objections have been made to condensed milk, and in all probability some of them are valid. We have already remarked that this food does not in all cases agree with infants.

It has been claimed that the character of the caseine is unchanged. It is possible that the diluent, barley or rice water, may correct this to some extent. Certain it is that condensed milk with the above diluent agrees well with some children.

It has also been claimed that the large amount of cane sugar or glucose used in the preparation of condensed milk, make it more susceptible to fermentation. I am not aware that this objection has been removed, unless it is in a condensed milk made without sugar.

After the milk foods, come, it appears to me, the so-called Liebig's preparations. Some of these are used with cows' milk, and by this addition it is claimed that we obtain very nearly a preparation corresponding physiologically with mother's milk.

It is claimed for Mellin's food:

That it is a soluble dry extract from wheat and malt.

That it is perfectly free from starch and cane sugar; the starch being converted into dextrine and grape sugar.

That it is entirely free from husks, indigestible inert matter and animal germs.

That it contains a large amount of proteids (albuminoids) and soluble phosphates and that it is alkaline in reaction.

It is not claimed that this food has sufficient fat to nourish a child and to supply this, cream may be added. It is claimed, however, that by its addition the albuminoids are so changed that small flakey curds are formed in place of hard, dense ones.

This food certainly has stood the test, and at the bedside has been found of great value in the practice of those who are studying this subject and whose opinions are worthy of respect.

OBJECTIONS TO LIEBIG'S FOOD.

These are composed largely of barley, malt and wheat flour, and starch, which has been converted into *maltose*. These foods will not nourish a child sufficient without the addition of cow's milk, and as their constituents (Mellin's and Horlick's food) are nearly the same in nutritious value as cow's milk, it is urged that they do not add anything to cow's milk, except sugar and an alkali. It is claimed that the addition of the maltose does not prevent the formation of hard coagula from the caseine of cow's milk. From experiments which I have recently made — and my thanks are due to Prof. Salisbury of the Woman's Medical College, for assistance — it seems that the claim which is made by the advocates of the Mellin food is true, and that the addition of this food to cow's milk does cause it to break up in very small flaky curds. The fact that these foods contain a considerable amount of maltose, and are sometimes laxative to babies, possibly is true, but this may be said of most any other food.

MALTED MILK.

This is a new food, but from personal observation I can testify to the fact that it is of value in some cases. It has agreed with several very young children when other foods would not. The principle involved is that the diastatic action of malt is most closely allied to the active principle of saliva — the pancreatic and intestinal juices. It is made as follows: "In malted milk we present pure fresh cow's milk, combined with the extract of selected wheat and malted barley in a dry-powdered form, perfectly soluble in water, requiring no cooking, or the addition of milk, and free from starch. Situated as we are, in the midst of one of the best dairy districts, our milk is obtained from cows under our own supervision, and is evaporated before any change is possible. In addition to this, we select all our own grain, malt all our own barley by special process, by which we obtain the greatest diastatic action from the malt; we also do all our own grinding. Consequently we can guarantee all the ingredients, pure, fresh and unadulterated."

This food requires no cooking, neither the addition of milk, and is said to contain no starch.

OBJECTIONS TO MALTED MILK.

This comes from the fact that it contains a

large amount of maltose, and is liable to abnormal fermentation, the same as we find in Liebig's food.

PEPTOGENIC MILK POWDER.

This is claimed to be the safest and best physiological imitation of mother's milk, and is composed of milk sugar — the mineral matters and pancreatin. It is a substance to be added to cow's milk in order to make it possible for a child to digest the milk.

OBJECTIONS TO PEPTOGENIC MILK POWDER OR HUMANIZED MILK.

Theoretically, this milk should be very nearly the correct food; but, practically, we find that it disagrees with a considerable number of babies. The greatest objections are that it is not practicable in the household, because it requires scientific skill to properly pre-digest the food, and that many irregularities of digestion will certainly come about from this preparation. Recent writers have claimed that pancreatin is extremely liable to putrefactive changes, and that if it is used, it must be fresh and sterilized by heat. Foster says that "pancreatin, unless absolutely pure, swarms with bacteria." The theory of this food is good; practically it does not come up to the standard. It has been suggested that if this food is not rich enough to nourish a baby, cream may be added at each feeding.

CARNRICK'S FOOD.

I have carefully examined the process of the manufacturing of this food and believe that the greatest care is exercised in gathering the milk and the attempt is made to insure absolute purity. The dairies from which this milk comes are under strict regulations, and as soon as the milk is received it is drawn into digesting tanks and brought to a temperature of 115 to 120° and treated with freshly made extract of pig's pancreas. It is afterwards raised to a temperature of 210° to entirely destroy any pancreatic ferments; evaporated to the consistency of condensed milk, combined with dextrine and milk sugar; then evaporation continued and powdered and bolted.

This food is composed of 45 per cent of powdered milk, 45 per cent of dextrine and 10 per cent of milk sugar. It is partly pre-digested, so that the caseine is as readily digested by an infant as it is in human milk. Dextrine is used in place of maltose for the following reasons: Dextrine is not fermentable until changed into sugar. The youngest infant can supply sufficient ferment to digest dextrine, and when the process of digestion is under way, abnormal fermentation is not liable to occur. The milk is only partly pre-digested, because it is not advisable to entirely digest any food before ingestion. It has been claimed by Prof. Vaughn that preserved dry milk, if properly done, will keep for any length of time; and it is claimed that of the many hundred thousand cans of this food, which have been placed upon the market during the past three years, not more than a dozen of them have been returned in bad order. Finally, it is claimed of Carnrick's food that it is the only artificial food which will thoroughly nourish a child without the addition of cow's milk; that it approaches nearer human milk in composition and digestibility than any other artificial food, up to this time, that has been placed upon the market. It is also claimed that it will agree with a larger number of children than any other artificial food.

Personally, the food has agreed with children in my practice, and has certainly "bridged over" some who have not been able to take any other food. In my experience it is hardly rich enough, however, and fat in the shape of cream must be added.

GRANUM AND RIDGE'S FOODS.

It has been generally conceded that starch can not be digested by young infants from the fact that their digestive fluids are lacking in certain constituents. Upon this basis certain foods which are known to contain starch have been objected to. Theoretically, it is probably true that babies — at least a large number of them — cannot digest starch, yet, practically, we know that some babies do take care of this kind of food excellently well. According to rule a baby or young child should not eat potatoes; this kind of food should disagree with them. As a matter of fact, we do know, however, that some children thrive excellently well upon this kind of food.

Imperial Granum and Ridge's food have been placed in this class, or as Farinaceous foods. They have been tried and tested for a long period and it must be confessed that for older children they do well in many cases. Time will not permit me to enter into the details of manufacture. They are made largely from the best of flour, made very fine, and thoroughly cooked by which a large part of the starch is changed into dextrine.

In the Foundlings' Home in Chicago, for very young and undeveloped babies cream foods take the preference; then comes Nestlé's food, and afterwards for older children, Granum. Ridge's food is a favorite; but the peptogenic milk foods have fallen below the standard.

Probably one of the most important questions which should engage our attention is the

FERMENTATION OF MILK.

Fermentation of milk occurs only in consequence of the introduction into it of micro-organisms. If the milk be received by a sterilized tube into a sterilized receptacle directly from the udder of the cow, it will not ferment nor become acid, though kept indefinitely. But except these precautions are taken, the germs always gain access to it, consequently in order to prevent its

fermentation, it is necessary to heat it. It can be sterilized by heating to 70 degrees for an hour by which process the adult bacilli are killed, but in order to kill the spores it is necessary to repeat the process for an hour each day for four or five days. Heating to 100 degrees by a current of steam for one hour will sterilize it completely, but boiling coagulates the albumen and to some extent changes the milk sugar. The first process in the fermentation of milk is due to the action of a bacillus, and consists in the conversion of the milk sugar into lactic acid. This process ceases after a small quantity of acid is formed, but if the acid be neutralized by chalk, the fermentation will go on until the milk sugar is all decomposed. By the change of reaction of the milk the caseine is coagulated. This coagulation is said to be due to the action of the acid and not directly to that of the bacillus. When the milk sugar is converted into lactic acid, another bacillus — bacillus subtilis — attacks the lactic acid and converts it into butyric acid with evolution of carbon dioxide and free hydrogen. This bacillus cannot act on milk sugar unless it is first converted into lactic acid.

Under exceptional circumstances there is formed in milk a substance first discovered by Prof. Vaughn, of Ann Arbor, and named by him "tyrotoxicon" (cheese poison). This substance is a crystalline nitrogenous substance, and is supposed to be a ptomaine. When taken it produces pain at the base of the brain, vomiting or retching and purging. When given to an animal similar symptoms are produced. Prof. Vaughn believes this to be the cause of cholera infantum. Tyrotoxicon is formed spontaneously in milk after some months; and it will be produced very quickly if some milk in which it has been formed be added to fresh milk. Its formation seems to be connected with the butyric acid fermentation.

In conclusion I have to repeat my quotation made at the opening: "Nature does not afford, nor can art supply a substitute for mother's milk."

1. Mothers should be encouraged by every argument possible to nurse their children, and the dangers of too early weaning for trivial causes should be demonstrated to them.

2. If from causes which we can not control and which seem rational and valid, a mother can not nurse her child then, in cities at least, a wet-nurse should be procured.

3. A mixed diet is preferable to an artificial one.

4. For very young infants in lieu of mother's or nurse's milk, cream with barley, rice or oatmeal water, to which milk sugar and either common salt, phosphate of lime or lime water in small quantities, is added, seem to agree best.

5. For older children cows' milk and the so-called milk foods, and it would seem from some recent analyses of cows' milk, that if all kinds of fermentation can be prevented that the task of preparing cows' milk so that it will agree with infants, will not be as difficult as it has formerly been. It also seems that it is along this line that investigation should in future be made. We must not only insist that good milk shall be provided, but also that it shall not have in it bacteria If milk is used let it be thoroughly boiled, and for a long time; if it is diluted with water, let it be absolutely pure; if the attempt is made to make it more nutritious by the addition of cream, let it be that which has not already undergone partial decomposition. The sugar added should be pure milk sugar, and if a small amount of wheat or flour is used, this too should be thoroughly cooked.

6. If artificial foods are used, let the clinical test decide which shall be selected, and when one food is found to agree with a child, let the growth and increasing nutrition of that child, or its loss in weight and commencing atrophy, be the guide for the substitution of some other food. I cannot designate particular foods for reasons perfectly obvious. Every food has its advocates; every food has its chemical analysis which prove, without any shadow of doubt, that it is chemically and physiologically the only substitute for mother's milk, and yet every one of them, sometimes fail us, I will admit that this is true of mother's milk in rare cases. But, as a rule, let our advice be in the order I here name — mother's milk, pure milk, cream foods, milk foods, malted foods, farinaceous foods; always pure, free from bacteria and each preparation, whatever it be, frequently inspected.

CEREBRO-SPINAL MENINGITIS.

RECOGNIZING INCIPIENT CONGESTION AS BASIS OF TREATMENT.

Read in the Section on Practical Medicine at the Thirty-ninth Annual Meeting of the American Medical Association, May, 1888.

BY J. McFADDEN GASTON, M.D.,

PROFESSOR OF THE PRINCIPLES AND PRACTICE OF SURGERY, SOUTHERN MEDICAL COLLEGE, ATLANTA, GA.

The disorder known as cerebro-spinal meningitis presents various phases in different cases. It all the symptoms observed in the many forms of this affection were collected, they would afford a most extraordinary nosological group. Phenomena that ordinarily accompany other diseases are often associated with this Protean malady; and yet there is no single development of its characteristics which is essential to its recognition. Even the opisthotonos, which may be regarded as pathognomonic when present, is sometimes absent in cases in which the progress of other developments leaves no doubt about the true diagnosis.

The multifarious elements that enter into the the history of this disease are well calculated to deceive the practitioner in an isolated case, but it

most frequently occurs in an epidemic form or in groups, so as to throw light upon the diagnosis in cases not presenting distinctive features. It also undergoes very striking modifications in its different stages of development in the same individual. The primary congestive feature is variable in its degree and duration, inducing general vital depression to a greater or less extent, followed by reaction with febrile indications. This leads to, or is accompanied by, inflammation in the coats of the brain and spinal cord, and the consequent effusion of serum or the production of pus. The accumulation of these fluids in the arachnoid cavity and in the ventricles of the brain, induces frequently impairment of vision, especially, according to my own observation, in the left eye, and deafness with subsequent indications of paralysis, either paraplegia or hemiplegia. I have had occasion to note recently the occurrence of complete loss of motion and sensibility in the arm and leg on the right side, after the left eye had become affected, in a case which was diagnosed previously as cerebro-spinal meningitis, and which terminated fatally in a few hours afterwards.

The appearance of ecchymosed spots, especially on the legs, would indicate a breaking down of the blood crasis as the disease progresses; and yet the observations made upon the blood in the early stage show an increase of fibrin, and there is a buffy coat upon the surface, with coagulation of the blood, when discharged into a vessel by venesection as in former days.

In the progress of this disorder, pains in the extremities, with swelling of the joints, sometimes become troublesome attendants; and by some peripheral association with the great nerve centres it is found, that a certain transition occurs, leading to collapse.

This general and superficial outline of the developments, gives only a very meagre presentation of the various phenomena observed in cases of cerebro-spinal meningitis. I refer to these data, from my professional experience, to impress upon my colleagues the gravity of the progressive stage of this disorder, and the great importance of an early recognition of the true character of the case, with an immediate application of measures calculated to arrest its tendency to a fatal result.

The fundamental element in serious cases, at the outset, is evidently an overpowering impression upon the nerve centres; and those who have watched closely the concomitants of the early stage must have remarked a striking correspondence between the main features of this disease and those found in pernicious fevers or in those cases known as congestive chills. The heat of head, coolness of extremities, heavy respiration, and general discomfort, are common to them.

The participation of the ganglionic system with the cerebro-spinal system of nerves is shown, by the marked vital depression; and there is evidently a lack of nerve power to maintain the normal performance of the various functions of the body, inducing congestion of all the internal organs. It has been demonstrated, by experiments on the inferior animals, that the division of nerves which supply a part and the deprivation of the nerve force, leads to congestion of the vascular structure; so that we are prepared to comprehend how enervation becomes the precursor and concomitant, if not the direct cause of congestion.

While we know very little of the real nature of the atmospheric or climatic influence which operates at certain seasons in particular localities, as the remote cause of cerebro-spinal meningitis, there is something in the sudden changes of the weather, which strongly predisposes the organism to vital depression, and hence to congestion of the viscera. As a consequence of this engorgement, there is doubtless an atonic state of all the internal organs, which becomes manifest earlier or later by marked prostration, and eventually leads to collapse, which is rarely, if ever, relieved by any kind of treatment, so as to arrest a fatal result.

If a patient passes through this congestive stage of the disease, the reaction is attended with inflammatory developments, and the membranes of the brain and cord are involved, so as to warrant the designation of cerebro-spinal meningitis; prior to this, however, the injurious impression of the congestion and vascular engorgement may have reached a point which does not admit of a high grade of inflammation of an acute character, but the symptoms indicate an atonic condition, with a low form of fever and subacute inflammation of the cerebro-spinal membranes. It is one of the most difficult problems in clinical experience to diagnosticate one of these cases in its commencement, as there is really no feature of a distinctive character prior to the inflammatory development; and yet, for all practical purposes the occasion has passed for effective treatment in grave cases when the inflammatory process has been established.

My object in preparing this paper has been to emphasize the great importance of recognizing the gravity of the situation at an early period, by the general symptoms indicative of congestion, and not wait for indications of inflammation to determine upon the nature of the disease.

If there is an epidemic prevalence of cerebro-spinal meningitis, or if other patients have been attacked with it in the same neighbrhood, then it becomes a comparatively easy matter to diagnosticate a case in the formative period; but when the disease occurs sporadically, as it sometimes does, it behooves the practitioner to proceed upon general principles, in recognizing the prodromata of the disease as corresponding in all their essentials to the accompaniments of the grave class of

pernicious fevers; and in noting closely the evidences of congestion, as the typical forerunner of the inflammatory stages of the disease.

If a doubt exists in regard to the ultimate manifestation of the characteristics of cerebro-spinal meningitis, there are still presented phenomena which indicate a recourse to a mode of treatment which is calculated to arrest the development of the disease; and it is to this factor in the case that I have to direct the special attention of the profession. The practicability of controlling a case in which congestion of vital organs is well declared, but without affording the data for a differential diagnosis in favor of cerebro-spinal meningitis, has been verified by me in several instances; and I would much prefer to give my patient the benefit of the doubt, to risking the serious consequences of delay for the purpose of making an assured judgment as to the true solution of the prospective pathological issue. Outside of my own practice I have had an opportunity of observing quite a number of cases of this disease in consultation with different colleagues in this city within the past four years, and they corroborate my statements as to the evidences of vital prostration in the early history of the grave type of cerebro-spinal meningitis. Among the patients thus seen, I may note some cases of special interest which occurred in the Fulton county jail, in the persons of United States prisoners, under the charge of Dr. C. A. Stiles, who has kindly furnished me with the following record:

There were forty-five cases of meningitis of varying intensity—thirty-five of which were cerebro-spinal, and the balance were spinal meningitis—during the spring months of 1885 and '86, treated with the following results:

About 80 per cent. of the latter died and 40 per cent. of the former. The small percentage of fatal results in the former was due to the fact that about one-third of the cases were of a mild type. The onset of this disease was invariably sudden, manifested by chilliness, nausea, vomiting, intense pain in the head, neck, back and lower extremities. Then appeared tetanic spasms or rigidity of muscles of the neck, back and limbs, which sometimes resulted in the neck and back being drawn posterially in the form of a bow; the hands and feet being contracted into very unusual positions. There were in some cases painful swellings of the joints of the upper and lower extremities, resembling inflammatory rheumatism. The entire body was sometimes so sensitive, that even the weight of the bed-clothes caused pain. There frequently occurred deafness, impairment of vision and congestion of conjunctiva, with double vision and pupils alternately contracted and dilated or one pupil dilated with the other much contracted. The eye-balls were frequently immovable with a fixed stare. The pulse was sometimes variable, being at one hour slow and at another accelerated, but diminished in volume and strength, so that at times it was imperceptible. The respiration was slower than natural in most cases. The skin at the outset was almost always abnormally cool, and the temperature below the normal standard. In the majority of cases constipation of the bowels was present; but in others diarrhœa alternated with the constipation. There was often atony of the bladder requiring the catheter to draw off the urine; which was scanty and high colored. When a patient survived the inflammatory condition it gave way to a typhoid character with redness of the tongue, pain in the epigastrium, sometimes extending over the entire abdomen, and vomiting a greenish fluid. On different parts of the body were noted purplish or dark spots, due to subcutaneous extravasation of the blood, connected with the adynamic state of the capillaries. A mild case of this disease frequently runs its course under the use of palliative measures without risk to life. But when the antecedents of such gravity as usually usher in a case of pernicious fever, herald the approach of this disease, we may reasonably presume upon a fatal result if the progressive congestion is not arrested before the development of inflammation, and nothing short of a radical relief of the overpowered nerve centres can avail.

In studying the means of treatment that are generally recommended by writers on epidemic cerebro-spinal meningitis I have been strongly impressed with their inefficiency to arrest the depressing and ultimate disintegrating progress of the disorder, and while the recourse to opiates has, in some cases, seemed to afford relief, it is evident that in most cases it only soothes the passage to the grave.

Instead of clogging the secretions and benumbing the sensibilities by anodynes, there is an urgent demand for restoring the functions of the vital organs and arousing the nerve centres to action, by revulsive applications externally and revolutionary measures internally, which shall bring about a change in the vital forces as promptly as possible. This mode of proceeding, which has been adopted with favorable results in some cases which presented features of gravity, is commended to the unbiassed judgment of those who may have to manage that form of cerebro-spinal meningitis which proves intractable by other means.

Relying upon the special properties of a mixture of calomel and quinine, from having observed the effects of this combination in pernicious or congestive fevers, I have employed this treatment with the happiest effect for the purpose of jugulating the progressive development of the congestive stage of this disease. Sulphate of quinine in doses of 15 grs. with 5 grs. of calomel, in pills or capsules, may be given every two hours until four doses are taken. It will be found that the indi-

cations of local determination to the head may be effectually combatted by placing the lower extremities in a hot mustard bath, while cold is applied to the head. In the meantime a mustard plaster along the spine assists in restoring energy to the nervous system, while similar applications are made to the inner portions of the arms and legs. If the stomach should be irritable 10 grains of bicarbonate of soda with ⅛ of a grain of sulphate of morphine may be given at intervals for its correction.

For the purpose of illustrating the course pursued in cases which are not arrested by this heroic treatment at the outset, I may give an outline of the report of a case which was published in the May number of the *Southern Medical Record* for 1885.

On the 19th of April I was called to a white boy, 3½ years old, who had been sick for two days previously. There was great heat of the head, with flushed face and dilatation of the pupils, with a mottled appearance of the skin over the body. The pulse was one hundred beats to the minute with marked tension. There was writhing of the body with tossing of his arms and legs, accompanied by a fixed stare of the eyes, and want of mental perception, with repeated sharp outcries at short intervals. The little patient was placed in a tub of warm water with a blanket wrapped around the shoulders and over the tub, so as to keep in the warm vapor. A handful of powdered mustard was mixed with the water. Cold water was applied to the head during the half hour that he remained in the bath. In the meantime he was given the following internal remedy: Sulphate of quinine, 12 grs.; calomel, 4 grs., divided into 4 powders, one every two hours. It was only by prizing his mouth open with a large spoon that the medicine could be poured into his throat. A mustard plaster was applied along the spine.

April 19th.—The combination of calomel and quinine had produced two evacuations from the bowels, the heat of the head was less with some return of consciousness, and the pulse was 90 to the minute with pupils still dilated. There were discolored spots about the knees, and a well defined retraction of the head, with the tongue considerably coated, and decided thirst.

The quinine and calomel were repeated as on the previous day, with directions to follow this prescription by another, consisting of salicylate of soda, 1 drachm, fluid extract of jaborandi, and syrup of orange peel, each 1 ounce, a half teaspoonful with a tablespoonful of water to be taken every two hours.

April 20th.—The symptoms had undergone quite a change, and there was no longer undue determination to the head, while the pulse was 110 to the minute without that tension previously observed. The bowels had been moved again after taking the calomel and quinine, while the warmth of the general surface was above normal.

April 21st.—The moderate reaction of yesterday had given way to a partial collapse, and the little patient lay in a semi-comatose condition with his mouth partially open, and upon raising the eyelids which were closed, the pupils were found contracted. He was ordered whisky-toddy, and upon being raised to drink it, a striking and extraordinary dilatation of the pupils occurred, manifesting disordered nerve centres. The warmth of the surface was below normal even upon his face and ears. The pulse was 130 to the minute and without tension. The opisthotonos had diminished, and the ecchymosed spots had almost faded away. The urine was passed involuntarily.

He was ordered a tablespoonful, every two hours, of a solution of carbonate of ammonia, having 20 grains to the ounce, and a tablespoonful of good whisky with milk in the intervals, with plasters of mustard to his extremities.

April 22d.—The tendency to collapse had ceased, his mental state was better, and he took his medicine with the milk punch in the intervals without further trouble. The pulse was 120 beats to the minute with better tone, the natural temperature had been restored, while the tongue was clean and moist. The bowels had been moved and urine passed in bed with tympanitic distension of the bowels. A poultice of flaxseed with Peruvian bark was applied to the abdomen.

April 23d.—The patient had improved in all respects with a pulse of 125 to the minute. He was given a teaspoonful of Colden's Liquid Beef Tonic every four hours, continuing the carbonate of ammonia and the milk punch in the intervals. The poultice was removed and a flannel roller with camphorated spirits of turpentine was applied to the bowels.

April 25th.—Not having visited the patient yesterday, it was found to-day that his bowels had too frequently moved with mucous discharges and considerable tympanitis. The pulse was 120 to the minute, and the tongue clean but redder and dryer than natural.

The following was given:

Spirits of turpentine	f℥j
Carbonate of ammonia	℥j
Elixir of paregoric	f℥j
Camphor water	
Mucilage of acacia, āā	f℥iij

Mix, and take a teaspoonful every two hours. Stop beef extract, and take boiled milk with whisky after each dose of the medicine. Continue spirits of turpentine with camphor to the bowels.

April 26th.—Frequent discharges of mucus with tympanitis, pulse 140 to minute, tongue red and smooth but not dry. Consciousness has returned. In addition to medication of yesterday he takes the following:

Sulphate of quinine	gr. xij
Acetate of lead	gr. vj
Tannin	gr. iv
Opium	gr. ij

Mix and divide in 12 powders.

Take one at intervals of two, three or four hours according to the frequency of discharges from the bowels. Apply red-oak bark poultice to abdomen after rubbing the surface with camphorated spirits of turpentine.

April 27th.—The irritation of bowels ceased after second astringent powder, when they were suspended. The poultice was discontinued, using a flannel roller with camphorated spirits of turpentine upon the abdomen. The tympanitis has disappeared; tongue not slick and red as before, pulse 125 to the minute, and passed the night quietly. Still some stiffness of neck. The terebinthinate mixture was alternated with one grain of quinine every two hours, taking milk punch after each.

April 28th.—Passed a restless night, and shows nervous agitation to-day. Bowels only moved twice in thirty-six hours, the tongue moist with slight coating, pulse 125 to the minute. Gave 5 grains of chloral hydrate, to be repeated hourly for three times, and if not quiet within two hours afterwards, to give ¼ grain of morphine. Continue terebinthinate mixture and quinine with milk punch.

Notwithstanding that the neck is still stiff there is no deafness nor impairment of vision and the intellectual faculties are not affected.

April 29th and 30th were passed in a state of great nervous agitation, notwithstanding the free use of chloral and morphine, so that other agents seemed to be required for calming him.

May 1st.—Observing an ash-colored fæcal evacuation I inferred that a stimulus to the biliary function was called for, and gave 3 grains of saccharated calomel, with instructions to repeat it every four hours, until the passages should be colored with bile. Within two hours an evacuation indicated a change in the color, and with the correction of the hepatic secretion it was expected that the nervous trouble would be relieved. The pulse was 125, temperature 100° Farenheit, tongue clean, no tympanitis, slight stiffness of neck, the pupils were normal and responded to varying degrees of light.

May 26th.—The closing record of this case notes that there has been no indication, recently, of any febrile excitement; but at times considerable nervous irritability and fretfulness, without any mental disturbance. He is still feeble, but without any consequences of the disease in contraction of muscles or defect of sight or hearing. His nourishment consists of milk punch, soft boiled eggs, etc. This result manifests the impairment of all the vital forces from this disease, even when the most energetic measures are resorted to at the outset to correct the disturbance of the nerve centres and the derangement of the biliary secretion.

It is evident that the symptoms, indicative of cerebro-spinal meningitis trouble, were controlled by the use of the calomel and quinine, followed by the salicylate of soda and fluid extract of jaborandi; and none of the usual results of the most aggravated cases, such as deafness or loss of sight connected with cerebral effusion, ensued in this case after the expiration of thirty-nine days' sickness, not including convalescence.

The details of this typical case, with many serious developments combatted by special measures, are presented in preference to giving the treatment of other patients, with a view to demonstrate clearly my practice in cerebro-spinal meningitis.

NOTE.—In the person of a vigorous man, about 30 years of age, on June 24, there occurred excruciating pains of the head, with contraction of the muscles at the back of the neck, and vital depression. At 9:30 P.M. he took 10 grains of antipyrin and repeated the same within an hour. He was directed to await the visit of my colleague, Dr. P. E. Murray, at midnight, to determine upon the propriety of a third dose. Upon his arrival the cervical muscles were found relaxed and the pain in the head much relieved, so that he withheld the antipyrin for the night. On visiting the patient next morning, I gave him the remaining 10 grains with complete relief of all the symptoms.

On the afternoon of June 25 he took 5 grains of calomel with 10 grains of bicarb. soda, three times, with intervals of two hours, followed next morning by citrate of magnesia, which had a purgative effect.

June 26 and 27, sulph. quinia was taken in doses of 10 grains and the patient is convalescent.

Was this a case of cerebro-spinal meningitis, jugulated by the antipyrin?

A CASE OF CHRONIC INTERNAL HYDROCEPHALUS.

Read before the Medical Society of the District of Columbia, February 22, 1888.

BY I. W. BLACKBURN, M.D.,
PATHOLOGIST TO GOVERNMENT HOSPITAL FOR THE INSANE, WASHINGTON, D. C.

The history of the patient, obtained from his mother is as follows: He was at birth smaller than her other children, and no disproportion of the head was noticed at that time. The delivery was accomplished by a midwife, who used strong traction without the assistance of the natural powers, and it is to this violence that the mother attributes the misfortune of her child.

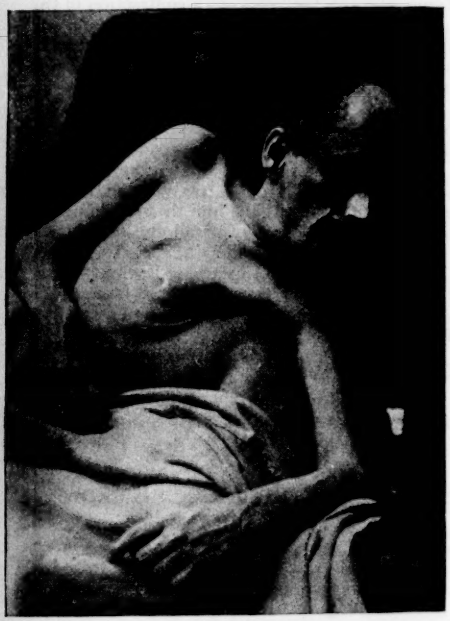
Enlargement of the head was not noticed until the child was three or four months old, when the mother observed a prominence at the posterior

fontanelles. The head rapidly increased in size until at the age of two years it was as large as at his death. The fontanelles remained open until he was seven years of age.

No attempt to walk was made until he was about 9 years old, when he made some efforts at locomotion, but was soon confined to his chair; later in life he used a rolling chair.

In early childhood his spine was straight, but it soon became extremely curved.

His general health was good, due to the extreme care of his mother, but he suffered much from headache, chronic constipation, and some form of urinary disease causing retention of urine at times. He never had convulsions, and though his movements were imperfect he had no distinct paralysis, and no disturbance of the special senses was observed until toward the end of his life.



C. F. Hydrocephalus.

The mental power was, of course, limited, but he had remarkably retentive memory, and though he could not read, having never been taught, he could remember and fairly understand what was read to him.

He was fond of singing and whistling, and could remember both, words and tunes after hearing them a few times.

His moral sense was well developed, and though he was mischievous he was harmless, and he often expressed his gratitude that he was a cripple rather than a drunkard.

A sense of humor was not altogether absent; he had some appreciation of a joke, and one of his greatest amusements was to look at comic pictures.

His articulation was imperfect, but he could be easily understood by those acquainted with him.

On admission to the hospital he seemed to be much prostrated, physically and mentally; he talked but little, and he was unable to sit erect without assistance.

His age at the time of his admission was 38 years; height, 4 feet 5 inches. The head was greatly enlarged, globular, and slightly flattened at the top, forehead prominent, hair scanty and some baldness of vertex and frontal regions. The scalp was thin and the vessels prominent and tortuous. The eyebrows were elevated and irides partly covered by the under lids. The teeth were irregular and carious. He had a small moustache and "goatee" but the beard was scanty.

The trunk was so much deformed by anterior and lateral spinal curvature that the left iliac crest occupied the corresponding axilla. The body, limbs and genital organs were ill-developed.

Death occurred from exhaustion and with symptoms of an exacerbation of the disease.

Autopsy. C. F., age 38 years; nativity, D. C.; mental disease, imbecility.

Autopsy twenty-four hours after death: Rigor mortis slight; decomposition commencing.

Cranium. The head measured twenty-seven inches in circumference; antero-posterior diameter 9⅝ inches; transverse diameter 7 inches. After removing the scalp the skull was 25½ inches in circumference; occipito-frontal diameter 9⅛ inches; biparietal diameter 6⅜ inches. The skull was asymmetrical, the left frontal, and the right occipito-parietal regions being more prominent, making a difference of half an inch between the two oblique diameters.

The skull was thinner than usual and somewhat dense, but the diploe was normal in proportion. The sutures including the frontal, were all well marked in the external table but the lambdoid and sagittal were obliterated in the inner table. No ossa triquetra were found. The depressions made by the convolutions and the meningeal arteries were unusually distinct. The cerebral fossæ seemed more shallow than usual, the orbital plates were somewhat flattened, and the pituitary fossa large and deep.

A paraffine cast was taken of the interior of the skull; it displaces about 98½ ounces of water, showing the cranial capacity to have been about 178 cubic inches.

Brain. The dura mater was normal in appearance and not adherent to the bone; the pia mater was normal; the cerebral vessels moderately filled, and the arteries at the base were healthy.

While removing the brain the ventricular cavity was accidentally opened and 57 ounces of clear fluid escaped. The brain collapsed and lay in folds at the base of the skull.

The brain weighed 43½ ounces; the left hemicerebrum, 20¼ ounces; the right, 18 ounces; the cerebellum, pons and medulla 5¼ ounces.

The convolutions were much flattened, the fissures shallow, and some of the latter were obliterated. The central fissure and convolutions were distinct on both sides and the fissures and convolutions of the occipital lobes were but slightly altered.

The cerebral substance was in some places not over $\frac{3}{16}$ of an inch in thickness. The thinnest portions were in the left frontal lobe and the right frontal and parietal lobes; the right side was considerably thinner than the left.

On opening the ventricles the lateral and third were found to be greatly dilated, having a capacity of at least 54 fluid ounces. The aqueduct of Sylvius and the fourth ventricle were not dilated. The gray commissure had been destroyed, the septum lucidum extremely attenuated, and the foramen of Monroe greatly enlarged. The basal ganglia were flattened and distorted and a small brown softening was found in each lenticular nucleus.

The ependyma was thick, tough and fibrous, and in some places had a reticulated appearance.

The brain tissue was pale and somewhat softened by post-mortem change.

The cerebellum, pons and medulla presented no unusual appearances except that the lining of the fourth ventricle was in a condition similar to that of the other cavities. The thorax was much deformed and the lungs corresponded in shape to that of the thoracic cavity. A few scattered calcareous nodules were found in the right lung.

The heart was small, but otherwise normal.

Spleen weighed 1¼ ounce, pulp normal.

Liver normal; gall bladder contained nine rough calculi.

The left kidney weighed 3 ounces; the right, 2½ ounces; structure apparently normal.

No mechanical or other cause was discovered for the effusion, but the condition of the ependyma indicated that the disease may have originated in a chronic inflammation of this membrane, and that the process was arrested in time to allow of closure of the sutures without the formation of supernumerary bones.

SEA-WATER IN LONDON.—The London Sea-water Supply Bill has passed both houses of Parliament. The sea-water will be brought to London from Sussex County. It is thought that the works will be completed by 1890. As London grows the supply of fresh water becomes scarcer, and it is hoped that the sea-water will be used for bathing and street watering.

RADICAL CURE OF PTERYGIUM.

Read to the Mitchell District Medical Society, at French Lick Springs, Indiana, June 22, 1888.

BY DUDLEY S. REYNOLDS, A.M., M.D.,

PROFESSOR OF GENERAL PATHOLOGY, HYGIENE, AND DISEASES OF THE EYE AND EAR, IN THE HOSPITAL COLLEGE OF MEDICINE, MEDICAL DEPARTMENT OF CENTRAL UNIVERSITY OF KENTUCKY, LOUISVILLE.

Pterygium has been variously described as being cicatricial in its nature, as due to small ulcerations in the limbus conjunctivalis, and as a genuine hypertrophy of the conjunctiva. A little attention to the anatomical characters of pterygium will show that the portion in contact with the fascia is made up almost entirely of abnormal connective tissue fibre.

It will be observed that the pterygium is not so broad upon its under surface as it is externally. There is a well-marked fold running longitudinally along its margins from apex to base. This marks the site of cicatricial tissue, which causes contraction to take place at the bottom of the growth, which seems to be most dense at the limbus of the conjunctiva, whilst that part which seems to overlap the cornea is formed by a folding in of that portion of the anterior elastic layer of the cornea which is involved in the apex of the growth. The capillary blood-vessels at the limbus of the conjunctiva are observed to be much altered. They are irregular in form and size, presenting the appearance of the new capillaries in callous tissue. The amount of connective tissue fibre and the number of wandering cells in the substance of the morbid growth serve to swell its bulk. If the pterygium be excised, the tendency to cicatricial formation is commensurate with the number of vessels divided. If no infecting material gain access to the wound, a large mass of irregular connective tissue fibre results from the changes which take place in the leucocytes and the wandering cells found in the loose network of cellular tissue always abundant in the ocular conjunctiva.

Arlt and Hasner have given much attention to this subject. They are persuaded that ulceration of the cornea at its periphery has little or nothing to do with the development of a pterygium. The well-known pinguecula which results from ulceration of the limbus conjunctivalis is always a purely local affection. It may be frequently observed in persons who have had purulent conjunctivitis with chemosis. In these cases, the loss of surface epithelium allows the overlapping conjunctiva to become adherent to the anterior elastic layer of the cornea; and when the infiltration disappears as the swelling goes down, the little loops of the conjunctiva which were folded up are attached to the surface of the cornea, and present the characteristics of what is commonly called pinguecula. This never extends out over the surface of the globe. It does not correspond to the direction of one of the recti muscles. On the other hand, pterygium always overlies one of the

recti muscles; it always extends either from the caruncle or from the sulcus of the palpebral fold; it is always both broader and thicker at its base; thinner and more vascular as it proceeds towards the apex. The apex is always formed by a folding in of the anterior elastic layer of the cornea; and the greater the amount of cicatricial tissue developed at the bottom of the apex, the further will the apex of the pterygium extend upon the corneal surface, the tucking in of the edges being brought about by the contraction of the abnormal connective tissue which results from an interruption of the passage of the leucocytes through the subconjunctival cellular tissue into the organized lymph tubes designed by nature to receive these cells.

It is clear, therefore, that pterygium partakes of the nature of a neoplasm. There can be little doubt it begins in the presence of some local irritation, which may perhaps be brought about by the presence of particles of sand, or such other irritating foreign matter as may be lodged upon the surface of the exposed portion. Wherefore pterygia are most commonly observed on the nasal or temporal side, by far the most frequently on the nasal side, owing, no doubt, to the facility with which minute particles of foreign matter gain access to the semilunar fold, where the irritation which leads to the flooding of the subconjunctival cellular tissue in this region with leucocytes, through the dilated capillary vessels, is brought about. Pterygium may, therefore, begin its development in an insidious manner and remain stationary for an indefinite period. Once begun, however, it may be incited to fresh activity in the presence of those causes which originally inaugurated it. Once the anterior elastic layer of the cornea is fairly invaded, the disturbance in the outlet of the leucocytes in the capillary loops of the limbus of the conjunctiva being permanently established, this portion of the growth advances with great rapidity. It is, therefore, important that some operative interference with the advancement of the corneal invasion should be instituted as soon as active development has begun, because that portion of the cornea invaded can never be fully restored to its normal transparency; and so the pterygium should not be permitted to advance into those portions of the cornea through which light is transmitted to form visual impressions on the retina.

Nearly all of the operations that have been suggested have proven unsatisfactory. There are two forms of operative interference, however, that may be accounted fairly successful, namely: the complete excision of the whole mass, and the closure of the resulting wound by stitching the normal conjunctival membrane together with fine silk sutures. There should be incisions made at right angles to the line formed by the wound made in the removal of the pterygium, to allow the flaps of the conjunctiva to stretch well over the surface which the morbid growth occupied. It should be remembered in dealing with the apex of the growth, there must be no mistake about the removal of the whole amount of morbid tissue. It is better, therefore, to tear off that part which is attached to the cornea by grasping the whole of the pterygium in the limbus of the conjunctiva with Graefe's fixation forceps, and making such traction upon the pterygium as will completely tear off from the corneal surface the whole apex of the growth.

Another method, and the one which I prefer, is a slight modification of Pagenstecher's operation. Pagenstecher dissects off the apex of the pterygium and, turning it back, closes the conjunctival wound with sutures.

This represents the outline merely of the operation that I have found most successful. My plan is to tear off the apex of the pterygium from the surface of the cornea and, if any small portions should remain adherent, to shave them off carefully with a cataract knife. It is better, even, to cut into the proper substance of the cornea, removing a small portion of the unimplicated tissue, than to leave even one abnormal connective tissue fibre on the surface; for this will certainly undergo persistent contraction. The next step in the operation is to divide the normal from the abnormal tissue along the margin of the morbid growth, down to its base. Then, seizing the apex of the growth with the forceps, the loose connective tissue which holds it to the surface of the ocular fascia may be severed with scissors. A free flow of blood should be regarded as auspicious. The conjunctiva may then be stitched together, and circular incisions made both above and below, corresponding to the corneo-scleral juncture, for the distance of ¼-inch from the line of union sought to be established by the sutures. Radiary incisions should then be made in the vertical meridian sufficiently to allow the ocular conjunctiva to stretch freely over the surface without having it thrown into folds. Incisions may be made at right angles to the line of union at the base of the pterygium, to relieve tension at this point. The pterygium itself should be allowed to lie undisturbed in its basilar attachments. The sutures will come away from the conjunctiva in three or four days at most, when good union will be found to have occurred along the whole line, while the pterygium itself undergoes rapid shrinkage, and disappears by the resorption of its constituent elements.

This character of operation may be made applicable to all forms af pterygium. Having practiced the operation for more than fifteen years, and never having witnessed a return of the growth at the site of its original development, I am persuaded this method is entitled to rank as a radical cure.

MEDICAL PROGRESS.

DIAGNOSTIC VALUE OF INSPECTION OF THE URETERS IN SYMPTOMLESS HÆMATURIA AND PYURIA.—MR. E. HURRY FENWICK says: In the exploration of the bladder with the electric light it is necessary to have some such starting point in order that the examination may be systematic, rapid and effective. The most important section of the bladder, speaking cystoscopically, is the inferior zone, and the cardinal points in this area are the orifices of the ureters. Upon them the operator should first direct the light, and from them the search should radiate. There are several reasons for this choice. From the orifices of the ureters may be seen to issue fine jets of renal blood in kidney bleeding, the semi-vividness of which may prove fallacious (without the cystoscope) in the diagnosis of the source of symptomless hæmaturia. Upon their lips or in their immediate neighborhood are most often to be found those tumors which can baffle diagnosis.[1] Moreover, their appearance, their clean-cut, slit-like openings, or their tumid, gaping mouths—that is, their healthy or unhealthy aspect—is an index to the soundness or unsoundness of the remainder of the mucous membrane, which cannot be neglected in the treatment or prognosis of disease.

In hæmaturia I generally first satisfy myself that the ureters are free from tumors, and then make a rapid survey of the rest of the bladder, proceeding from below upwards (that is, inversely to the tendency the zones evince to growth).[2] If I can find no cause for hæmorrhage I return to the orifice of each ureter, and watch the color and amount of its efflux. In three cases lately I have thus been able to detect the renal source of symptomless hæmaturia, which otherwise I might have overlooked.

Case 1.—Mr. B., consulted me in January 1888, in reference to a hæmaturia. He brought with him a specimen of bloody urine containing much clot. His history was as follows: In January, 1886, he had been out riding for two hours, and came home completely chilled. He passed blood the same evening. He suffered no pain or inconvenience, except a slight urethral tingling when the clots were passing. The hæmorrhage stopped in the summer, but recurred in the winter of 1887, to cease once more upon the advent of the warmer weather.

Present Condition.—"A well-built, anæmic man, æt. 30. The urine is voided thrice a day. No pain attends the act. He suffers 'agony' after coition, in the neck of the bladder. In micturating he has noticed that the urine often becomes more bloody towards the finish."

I expected to find a vesical growth with the electric light, but nothing abnormal could be discovered. The entire bladder was healthy. I was just giving up the examination in despair, when I saw a stream of brightish blood shoot right across the prism. Keeping the instrument fixed, I waited until the medium became clear again, and then I found that I was watching the orifice of the right ureter. In another second a jet of bloody urine burst from the tiny opening, and, after forming many rings, paled by diffusion and disappeared, but only to be replaced by a successor. The phenomenon of efflux suggested to my mind a minature cuttle-fish, squirting out its colored fluid into the water around. The right renal source of the hæmorrhage was at once indicated.

Case 2.—Mr. C. (under the care of Drs. Underwood and Harvey), a well-built man, æt. 52. Since May, 1887, he had suffered from hæmaturia, which was painless and intermittent in its character, and seemed more dependent upon exercise than anything else. The urine was passed thrice a day. He was disturbed only once at night. Some specimens of hæmaturia contained cylindrical clots. I passed the electric cystoscope under cocaine, and found a low collarette of prostatic growth, but it was obviously not the cause of the hæmorrhage. The bladder was healthy. I could see jets of blood issuing from the right ureter, and the diagnosis of the site of the trouble was at once established.

Case 3.—A lady, under the care of Dr. Hepworth, of Manchester, and Dr. Battersby, of Cannes. For eighteen months the patient had suffered from hæmaturia. The urine varied much in color, but there were no symptoms whatever to afford a clew as to the exact source of the bleeding. The electric cystoscope (No. 30 French gauge) showed the bladder to be perfectly healthy, but on turning the instrument towards the left ureteral orifice, a spurt of bloody urine flowed over the prism. I allowed the ureter to play upon the prism, in order to judge of the rhythm of the flow, but it never varied, although Drs. Hewitt, Lys, and I watched it for some little time. It was rather like an artery severed under water. I could detect no renal tumor in any of these cases.

These cases are sufficient to illustrate the value of inspecting the orifices of the ureters by means of electric light, and of excluding the kidneys as a source of the hæmaturia; moreover, the same advantage can be gained in pyuria, and the many methods and instruments advised and devised for obtaining urine direct from either kidney must now be partially superseded by the electric light.

[1] Single villous papillomata are found at the right ureteral orifice in 43 per cent., and at the left in 26 per cent. of the cases. Fibromata and small single myxomata in 90 per cent of the cases are situated at the ureteral orifices. Author, Lancet, March 10, 1888.

[2] The liability of the three zones to become affected by single cancerous growths may be expressed thus: The upper : middle : lower zone :: 1 : 3 : 6. Author Pathological Transactions, Carcinoma of the bladder, 1888.

The uretheral orifices are not difficult to find. They are very rarely displaced, and still more rarely are they absent. A little tact in manipulation and knowledge of the cystoscope will bring them into view, and amply repay the operator for examining them.—*Brit. Med. Jour.*, June 16, 1888.

THE "POLYCLINIC CARRIAGE" FOR EXTENSION AND COUNTER-EXTENSION.—DR. A. B. HIRSCH, of Philadelphia, has designed a simple apparatus to keep up continued traction—therefore, rest—while securing the advantage of out-of-door atmosphere. Its first occupant was a stout 2-year old boy, of the flaxen-haired, strumous type, the subject of incipient coxalgia. The value of complete rest in bed in this disease, with the difficulty of obtaining good hygienic surroundings in so many city homes, particularly in the summer season, are familiar. The "carriage" was therefore planned to meet these objects.

The carriage is an ordinary wicker-work perambulator, the body of which has been lengthened to fit the size of the patient by dividing vertically and exactly in the middle both the head and foot pieces, which are then straightened out and a new bottom made, neatly painted wooden boards being inserted to fill out the spaces at either end. Inside the entire length of the bottom of the body is placed an inclined plane of very light pine board, which rests in front on a block some two inches high. This inclines the child's body sufficiently upward to furnish a weight of three pounds, when the rubber band, to be mentioned later, is stretched about twelve inches. A light hair mattress and pillow suffice to cover in the bottom of the carriage. Sand-bags prevent any lateral motion.

The ordinary adhesive strap and stirrup apparatus being attached to the limb from below the hip (in this case the left one), a cord is fastened through the middle of the stirrup, passing through two screw eyes, one fastened to the footboard opposite the instep and the other at the right-hand angle. Then the cord passes backward to a heavy rubber band fastened to a hook screwed into the headband alongside and above the child. Any increase of traction can be made by simply further stretching this band, originally intended for closing doors when ajar. It was my intention to pass the cord from the stirrup, through the footboard and under the body of the coach, so as to attach a weight, but Dr. H. Augustus Wilson suggested the use of screw eyes and rubber band. His improvement, besides simplifying the apparatus and making it more sightly, avoids the painful jarring made in passing over gutters and all other rough surfaces.

In a similar coach since made, I obtained a greater inclination backward by simply screwing a hook underneath the body and fastening another such heavy band which passes around the rear axle.

The idea can, of course, be elaborated for more fastidious patients. The parts needed for the coach are supplied in Philadelphia by Gustavus A. Gefvert, orthopedic machinist, and Messrs. Charles Lentz & Sons, No. 2130 Master street, surgical cutlers.—*The Polyclinic*, July, 1888.

ARTIFICIAL FEEDING OF INFANTS.—DR. A. JACOBI, of New York, in a paper on the "Therapeutics of Infancy and Childhood," in the *Archives of Pediatrics*, says:

The principal substitutes for breast-milk are those of the cow and goat. The mixed milk of a dairy is preferable to that of one cow. Cow's milk must be boiled before being used. Condensed milk is not a uniform article, and its use precarious for that and other reasons. Goat's milk contains too much casein and fat, besides being otherwise incongruous. Skimmed milk, obtained in the usual way, by allowing the cream to rise in the course of time, is objectionable, because such milk is always acidulated. The caseins of cow's and woman's milk differ both chemically and physiologically. The former is less digestible. There ought to be no more than 1 per cent. of casein in every infant food. Dilution with water alone may appear to be harmless in many instances, for some children thrive on it. More, however, appear only to do so; for increasing weight and obesity are not synonymous with health and strength. A better way to dilute cow's milk, and at the same time to render its casein less liable to coagulate in large lumps, is the addition of decoctions of cereals. It has been stated before, that a small amount of starch is digested at the very earliest age. But cereals containing a small percentage of it are to be preferred. Barley and oatmeal have an almost equal chemical composition; but the latter has a greater tendency to loosen the bowels. Thus, where there is a tendency to diarrhœa, barley ought to be preferred; in cases of constipation, oatmeal. The whole barley-corn, ground for the purpose, should be used for small children, because of the protein being mostly contained inside and near the very husk. The newly-born ought to have its boiled milk (sugared and salted) mixed with four or five times its quantity of barley-water; the baby of 6 months equal parts. Gum arabic and gelatin can also be utilized to advantage in a similar manner. They are not only diluents, but also nutrients under the influence of hydrochloric acid. Thus in acute and debilitating diseases which furnish no, or little, hydrochloric acid in the gastric secretion, a small quantity of the latter must be provided for.

ALUM IN FURUNCLES OF THE EAR.—GRASH reports good results from alum solutions in furuncles in and about the ear.

THE

Journal of the American Medical Association.

PUBLISHED WEEKLY.

SUBSCRIPTION PRICE, INCLUDING POSTAGE.

PER ANNUM, IN ADVANCE.....$5.00
SINGLE COPIES.....10 CENTS.

Subscription may begin at any time. The safest mode of remittance is by bank check or postal money order, drawn to the order of the undersigned. When neither is accessible, remittances may be made at the risk of the publishers, by forwarding in REGISTERED letters.

Address

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION,
No. 65 RANDOPH STREET,
CHICAGO, ILLINOIS.

All members of the Association should send their Annual *Dues* to the *Treasurer*, Richard J. Dunglison, M.D., Lock Box 1274, Philadelphia, Pa.

LONDON OFFICE, 57 AND 59 LUDGATE HILL.

SATURDAY, AUGUST 4, 1888.

SIOUX MIDWIFERY IN CHICAGO.

We have lately encountered a striking example of irresponsible opinion, that is especially noteworthy as well on account of the vital moment of the issue, as by reason of its professional origin. As Kucher has aptly written, we must allow any physician the utmost liberty in his view and treatment of those morbid and physiological conditions, the nature of which is still in a measure conjectural. In the management of a case of hysteria, or in the administration of many internal remedies, the greatest latitude of opinion must be permitted. But in matters of vital moment, about which we have the firmest convictions, based upon the most conclusive evidence, no such differences of view can be for one moment tolerated. There is none of us that hesitates to denounce as an ignoramus or humbug the physician that proposes faith cure or some internal remedy for a luxation. Our intolerance is only intensified when such a physician alleges long and successful experience with the aforesaid therapy.

The case in point relates to a peculiar method of management of the third stage of labor, and the advocate of the procedure is a woman, that alleges the successful employment of the method for twenty-five years, in an experience of more than one thousand cases of confinement. She is legally qualified to practice medicine in the State of Illinois.

In an unique essay, recently published and widely circulated, she formulates the following conclusions:

1. "The uterus of the parturient woman should, in each and every case, be examined immediately after the expulsion of the fœtus, before the lower or cervical portion of the organ has had time to contract.

2. "This, the only opportunity of gaining a perfect knowledge of the condition of the uterine walls and annexa, should not be lost, as it can be done without injury to the patient, but to her great advantage.

3. "The parturient uterus should be as perfectly cleansed as possible. If there are such firm adhesions that they cannot be removed by gentle manipulations, we should advance the welfare of the patient by thorough irrigation of the genital tract, and by hot poultices to the abdomen. This should be done because high temperature hastens the sloughing process; and as ordinary observation has taught us that old decaying matters are less poisonous than fresh, we have good reasons for hastening the process. This explains, too, why a woman who absorbs poisonous matter during the later periods of childbed has better chance of recovery than one who becomes infected within the first twenty-four hours. It is said that this is because the uterus is further advanced in reconstruction, but this can only hold good with a uterus that had been wholly emptied, immediately after the birth of the child, because the uterus is not in a condition of perfect involution at the third day, and certainly not if left to its own devices."

In her own words, this female makes it "a fixed rule to examine the uterine cavity in each and every case of confinement, and to remove the placenta by passing the right hand up to its insertion and detaching it by friction with the finger aided by the left hand on the outside, carrying it down and out into the vagina. Then," she writes, "going over the organ again I gently remove the still adherent membranes, rubbing the velvety place of placental insertion in order to prevent any undue fibrous occlusion of veins, I am convinced of the usefulness—no, the necessity—of such a practice."

A patient cheerfully describes the procedure thus: "Dr. —— take the insides out of me, the same as I would take them from a chicken, and I feel as well afterward as if nothing had occurred."

While the woman, herself, naively volunteers the information, "I know the condition of a woman's pelvis after I have attended her in parturition as I know her face."

We do not intend to reflect upon the intelligence of our readers by any discussion of this monstrous procedure. The author's own words are sufficiently damnatory and we can add nothing to their fatal evidence.

It is at once apparent that the method is both needless and meddlesome. The adequacy of the Dublin or Credé's mode of placental delivery has long been demonstrated by the universal experience of the profession. Thus out of 48,249 labors, in the lying-in wards of Carl Braun[1], during 11 years—1862–1872—the placenta was expelled by this method in 48,132 cases, or 99.8 per cent. It was found necessary to detach the placenta by the hand introduced within the cavum uteri in only 117 cases, or 0.02 per cent., or once in 500 cases.

The terrible danger of infection must be obvious to the most casual observer, to say nothing of the interference with puerperal thrombosis, the risk of air embolism and the like.

Just at the present time, too, in the light that the researches of Schrœder, Stratz and others have thrown upon the physiology of the third stage of labor, the broaching of such a gratuitous and pernicious doctrine seems peculiarly inopportune. It is an anachronism. This method was extensively employed many years ago by the semi-civilized midwives of China and Russia, and a closely similar custom formerly obtained among certain tribes of North American Indians—notably the Sioux, Cheyennes, Arrapahoes and Papagos.[2] It must be admitted, however, that in general primitive peoples have placed main reliance on abdominal expression—the use of a *vis a tergo*—in the delivery of the placenta, and they have in some degree appreciated the dangers from traction on the cord and manual removal.

For the sake of the poor unfortunates that are liable to fall victims to this brutal relic of barbarism, we trust the practice will receive the immeimmediate attention of the State Board of Health. Certainly such flagrant transgression of the laws of medical science demands serious investigation at the hands of the guardians of the public health.

[1] Lehrb. d. g. Gynækologie. Wien, 1881. p. 182.
[2] Geo. J. Engelmann. Labor Among Primitive Peoples. St. Louis, 1883. p. 153.

A GASTROLITH IN MAN.

In the *Zeitsthrift für klinische Medicin*, Bd. xiv, Hft. 3, KOOYKER describes the remarkable case of a druggist, aged 35, who had a circumscribed tumor of the abdomen, occupying the epigastric and almost the whole left hypochondriac region. Its position was changed by the respiratory movements. It was the seat of spontaneous pains; and pain was also produced by pressure on the neoplasm. These pains subsided somewhat under a strengthening régime and the use of condurango bark. The appetite was increased, and the alvine evacuations became normal. At times the patient vomited a large quantity of mucus mixed with bile. The vomited matters rarely contained free hydrochloric acid. The patient said that he had a continual nausea, and that he had vomited blood. Emaciation and pronounced cachexia finally came on, with indolent tumefaction of the axillary and subclavicular ganglia. He refused to have exploratory laparotomy done, and the diagnosis of cancer of the pylorus was made.

At the autopsy the stomach, which was of normal size, was found to contain a concretion that almost completely filled the stomach, and having its form. Two small concretions filled the pyloric region of the stomach. The large gastrolith weighed 885 grams, was 18 cm. long, and 8 cm. thick (7.2 inches by 3.2), and of a brownish color. In place of a nucleus there was a small cavity, as large as a hazel-nut, in the centre of the concretion. The cut surface showed no concentric stratifications. The mass had a feculent odor, and contained no skatol. Microscopic examination showed that it contained starch corpuscles, vascular fasciæ, and vegetable cells containing chlorophyl, but there were no organized elements belonging to the animal kingdom. Chemical analysis showed that it did not contain more than 0.56 per cent. of nitrogen. The mucous and muscular coats of the stomach were thickened, and in the region of the cardia the mucous coat was studded with projections of papillomatous tissue.

It seems that an exploratory laparotomy, which the patient refused, might have been the means of saving the life of this patient.

DR. KIESSELBACH, Privat Docent at Erlangen, has been made Professor Extraordinarius in the Otiatric Clinic and Polyclinic.

EDITORIAL NOTES.

A HANDBUCH DER SPECIELLEN KLIMATOTHERAPIE UND BALMOTHERAPIE will be soon published by H. Reimer, of Berlin.

DR. SERAPIO ARTEAGA, a distinguished physician of Havana, and well-known contributor to medical literature, died in Mexico on July 6, of cerebral congestion.

MM. HÉVARD AND CORNIL, with the assistance of M. Hanot, have just issued through Felix Alcan the second edition of their classical work "*Trailé de la Phthisie Pulmonaire*," which has been out of print for some time.

ADULTERATION OF MILK.—DR. H. THORNS, in examining a sample of suspected milk, found ultramarine blue, in the proportion of 0.0823 per litre. This milk, when left for a time, showed a bluish color at the surface.

THE "REVUE SCIENTIFIQUE DES FEMMES" is a new journal recently founded in Paris, and edited entirely by women. It is edited by Mlle. Edwards, interne of the hospitals of Paris, Mlle. Chenu, licentiate in mathematical sciences, Mme. Brès, M.D., Mme. Simonnet, B. Sc. and professor of physics, and Drs. Mmes. Conta, Kraft, and Rose Perrée.

THE PROPOSED MEMORIAL TO VON LANGENBECK is to be in a form of a building, the "Langenbeck-haus," which, according to the *British Medical Journal*, is intended to be a home for all medical associations, and a place for scientific gatherings. The names of the late Emperor Wilhelm I and his Empress Augusta stands at the head of the list, and it was the Empress that suggested that the memorial should be a building rather than a statue.

SACCHARIN, says M. C. PAUL, has valuable antiseptic properties. It is this fermenticide action of it that acts on the gastric juice and retards digestion in certain diseases. Paul says that numerous experiments on a large number of microbes have shown the antiseptic properties of saccharin. It is an antiputrescent; in 1:200 solution it arrests ammoniacal fermentation of urine. In the same solution it arrests the development of bacterium termo, in a 1:300 solution it retards, but does not arrest the development of the streptococcus of puerperal fever, and in a 1:500 solution it arrests the development of the staphylococcus pyogenes aureus. As the drug is eliminated entirely by the kidneys, it may be asked if it will not act favorably on pyelitis and pyelo-nephritis. Clemens has had good success with it in two cases of vesical catarrh with ammoniacal urine. Saccharine may be substituted for boracic acid for washing out the bladder.

AMERICAN MEDICAL ASSOCIATION.

Report of the Committee upon the Coroner System of the United States.

Made at the Thirty-ninth Annual Meeting of the American Medical Association, May 1888.

This Association imposed upon your Committee a task of no slight magnitude, in requiring a report upon the Coroner System of this great country. The work of collating and digesting the laws, as existing in the various States required much time and thought. This has been, however, simplified in a great degree by utilizing the publication of Dr. John G. Lee, entitled, "Hand-Book of Coroners," Philadelphia, 1881.

Your Committee also placed themselves in correspondence with the Secretaries of the various State Boards of Health and elicited a mass of correspondence, comment, and facts of very great value. To these authorities we take much pleasure in acknowledging our obligation, and upon a careful examination of the same we find almost without exception, comes the criticism of faulty results from inherent defects in the present laws.

A careful analysis of the Coroner's laws reveals the fact that their preparation and scope, with only slight modification have been made in transcript from the old English code of time-honored custom. The important exception, however, is noteworthy, that they have been adapted to *American politics*, by the party in power usually giving the office to the holder, too often as a subsidy for supposed services rendered, rather than because of fitness to discharge duties of so great importance to the State.

In the progress of legal learning, as well as in medical requirement, these two great branches of special knowledge have greatly outgrown their former status and to be well versed in both is utterly beyond the training and education of the present generation. The former idea of fitness, fundamental to the Office of Coroner, was a medley of both legal and medical knowledge, without specific limitation or definition. Resulting therefrom, has grown up such indefinite ideas pertaining to the office and duties of Coroner that,

in many instances, he has been appointed without knowledge of either law or medicine, and under the laws existing in most of the States it is about equally the mistake to select the Coroner from either of the professions.

In one of the large cities, through which we passed on our way to this meeting, a delegate to the Association informed us that the office was held by a colored man and an Irishman, and this by illustration of neither color or race prejudice, but to the manifest low order to which the office had fallen, since these men were both illiterate. Dissatisfaction necessarily results from incongruities arising under such laws as well as from the improper selection of men manifestly unfitted to discharge duties often so vital to the well-being of the body politic.

From the legal profession protests are constantly being made that the high ends of justice often fail under our present laws; while for many years from one end of the land to the other has gone out a demand from our own profession for a radical reform. So deeply ingrained, however, is the system into the body politic, with the power and influence of the present-office incumbents and the lack of concerted combined action, that very little progress has been made in the right direction.

Dr. Quimby, in his address last year before this Association, very properly called attention to this great national necessity, and as a result of his earnest appeal your Committee were appointed.

Granting the necessity of reform based upon such abundant testimony, your Committee have thoughtfully considered the measures to be commended from which a better system may be evolved.

Fortunately they are not entirely without precedent and experience to guide them. Eleven years ago, after much labor and concerted effort, Massachusetts abolished her Coroner's system and passed an Act providing for medical examinations and inquests in cases of death by violence. We are indebted to Dr. Samuel W. Abbott, the efficient Secretary of the State Board of Health for much information upon the working of the law. The system of Medical Examiners meets with a very distinct general approval, and has the hearty coöperation and support of the medical profession.

Since the passage of the law about 15,000 cases have been investigated by the Examiners. As compared with the same amount of work under the old law, the expense has been considerably lessened, while the results have been vastly improved.

Connecticut adopted, in 1883, a new law electing a lawyer as a coroner for each county, and a medical examiner for each town. I briefly extract from a letter received from Dr. M. C. White, Medical Examiner for New Haven: "One feature of our new law giving all the business of the county to one lawyer secures immediate investigation by an experienced officer who understands law and the best methods of examining witnesses. . . . . He must investigate immediately all suspicious cases. He may call a jury. All this works admirably. Three-fourths of all the sudden, violent, or untimely deaths are disposed of by the medical examiners, reported and recorded, but require no legal investigation, since there is no suspicion of crime. . . . After nearly five years of experience under the present law I think the defects or questionable points are so few that we may say there is pretty general satisfaction with the law."

Rhode Island adopted a new law somewhat recently similar to that of Massachusetts, and Dr. Charles H. Fisher, Secretary of the State Board of Health, writes me that "it is a great improvement upon the preceding law and methods."

Your Committee desire to formulate in greater detail the results of their labors, much of the material which they have received being of value, but manifestly quite out of time and keeping for this occasion, but they commend for earnest consideration in each of the several States the following propositions:

1. To abolish the office of Coroner.
2. To dispense with jury service.
3. To separate the medical from the legal duties in all cases involving the examination into the causes of death where crime is suspected.
4. To entrust the medical examination only to competent medical officers properly trained in their work.
5. To make the number of these medical officers as small as consistent with the proper discharge of their duties.
6. To consign all questions of law only to properly qualified legal magistrates.
7. To remove the appointment of these officers entirely from the question of political consideration, and to be based only upon their possession of the requisite and proper qualifications.

Upon some basis of this character should the Coroner's law be revised. Much useless expenditure of time and money will be avoided, often great sorrow and anxiety will be prevented, and that which is of vastly greater importance, the ends of justice will be far better served.

Owing to the vital importance of the subject, the difficulties of carrying into effect a sweeping revolution of time-honored customs, and in the hope that this great central organization may in some way be of service to any State endeavoring to secure a better law, your Committee, much against their personal desire, are constrained to ask to be continued for another year with the power of enlarging its numbers if deemed advisable.

Thus, with ample time to review and select from the material on hand, and that which may be for-

warded to us by all interested in the subject, we shall hope to give a *résumé* of the Coroner's laws, their workings, defects, and suggestions as to reform and to the establishing of laws which shall be effective in every State of the Union.

HENRY O. MARCY, of Boston.
J. H. HOBART BURGE, of Brooklyn, N. Y.
W. W. DAWSON, Cincinnati.

SOCIETY PROCEEDINGS.

American Ophthalmological Society.

Twenty-fourth Annual Meeting, held at the Pequot House, New London, Conn., July 18 and 19, 1888.

WEDNESDAY, JULY 18, FIRST DAY.

THE PRESIDENT, DR. W. F. NORRIS, of Philadelphia, called the Society to order.

The deaths of Dr. C. R. Agnew, Dr. E. G. Loring and Dr. Joseph Aub, were reported.

DR. H. D. NOYES, of New York, read a memorial of the late Dr. C. R. Agnew.

DR. C. S. BULL, of New York, read

A CONTRIBUTION TO THE TREATMENT OF MEMBRANOUS OPACITIES IN THE VITREOUS.

These opacities in the form of membranes or shreds are rarely freely movable and usually resist internal treatment. Operation by incision with a needle was first performed by von Graefe. In the experience of the writer the operation had been found useful. Some opacities, as a result of hemorrhage or inflammation of the choroid, sometimes respond to internal remedies, but as a rule these fail. By incision of the membrane a direct improvement of vision may be obtained and the process of absorption may be stimulated. Posterior opacities are more easily reached, with less danger to the lens and with more favorable results, than in the case of anterior opacities. The author has done this operation in seventeen cases of chronic membranous deposits in the vitreous. In some cases the ordinary decision needle was used, in others a broader needle, and in a few a slender cataract knife. Cocaine was employed in all cases. The point selected by preference for the introduction of the needle was just in front of the equator of the eye and below the insertion of the external rectus muscle. There seems in this operation to be no danger of loss of vitrious through the small opening, nor is there danger of hæmorrhage. The puncture should be posterior to the ciliary process and pressure with the forceps should be avoided. Little or no reaction follows the operation as a rule. A protective bandage is required only a few days. Antisepsis was employed in all cases.

The details of the seventeen operations on fifteen patients were given. Fourteen showed decided improvement in vision; three were failures. There was no loss of vision from the operation in any case. The operation is appropriate in certain cases, but it is wise to wait until all inflammatory symptoms have subsided before attempting any operative procedure. The eye should be absolutely free from all irritation before surgical interference is attempted.

DR. F. BULLER, of Montreal, read a paper on

A CASE OF PULSATING EXOPHTHALMOS CURED BY LIGATION OF THE COMMON CAROTID.

The author had seen four cases of this affection. In the first the condition followed a blow upon the head. Some months after the appearance of the pulsating exophthalmos, ligation of the carotid was performed, but the patient died in the course of a few weeks from repeated attacks of epistaxis.

The second case has already been reported. In the third case the affection followed a blow on the brow from a piece of iron. The patient was seized with severe epistaxis and died in a few minutes. There was found a depressed fracture of frontal bone with a fissure extending across the orbital roof and body of sphinoid bone, directly beneath the cavernous sinus. As a result of caries of the bone there was a direct communication between the nasal cavity and the internal cartoid artery.

The fourth case, the subject of the paper came under observation May 24, 1888. A young man, aged 28, fell a distance of twenty feet, striking the right side of head, rendering him unconscious for twenty-four hours. After the swelling had subsided the patient noticed diplopia, one image being higher and less distant than the other. There was also a loud beating sound in the right ear. Two weeks before coming under observation prominence of the eye was noticed. There was still diplopia, the higher image moving up and down with each heart-beat. Four days before coming under notice, the pain became intense. On examination there was at the inner extremity of the right brow a swelling which imparted a distinct thrill to the finger. There was also a harsh bruit. Pressure over the common carotid diminished the intensity of the thrill and lessened the pulsation.

It was decided to ligate the common carotid in the upper part of its course and this was done May 25th, two ligatures being applied and the vessel divided between them. The immediate effect was softening of the swelling, partial reposition of the eye-ball, great diminution in the pulsations and disappearance of the bruit. The patient made a good recovery and left the hospital with very little prominence of the ball: $V=\frac{20}{20}$; movements normal.

DR. CHAS. J. KIPP, of Newark, N. J., reported a case of

PULSATING EXOPHTHALMOS.

A lady 76 years of age presented herself with the history that shortly after striking the head in a fall, she noticed a noise in both ears, followed by protrusion of both eyeballs, the right four-tenths of an inch; the left, two-tenths of an inch. There was no marked pulsation, but there was a thrill and a bruit could be heard over the anterior half of the head. This could be arrested by compression of the right carotid and partially so by compression of the left carotid. In view of the age of the patient, no radical measures were recommended, but it was suggested that pressure be made on the right carotid as often as convenient. Iodide of potassium was also given. Three months later the patient stated that the noise had suddenly disappeared. This was followed by the disappearance of the exophthalmus first in the left eye, and subsequently in the right. The external appearance of the eyes is now normal. There is, however, a marked pulsation of the right subclavian artery, but no aneurism can be discovered.

DR. S. D. RISLEY, of Philadelphia: I would call the attention of the Society to the fact that Dr. Harlan reported a case of this kind cured by compression, and that I also reported a case in which compression of the vessel for a short time was followed by disappearance of the symptoms and subsidence of the exophthalmos.

DR. SWAN M. BURNETT, of Washington, read

AN ANALYSIS OF 576 CASES OF THE REFRACTION OF HEALTHY HUMAN CORNEÆ, EXAMINED WITH THE OPHTHALMOMETER OF JAVAL AND SCHIOTZ.

These 576 corneæ belonged to 301 persons examined within a little over a year by Dr. Burnett. Pathological states of the cornea were excluded for consideration at another time. The corneal refraction was found to be the same in both eyes to within 0.25 D. in 110 persons. The horizontal meridian (to within 5°) was the least refractive (astigmatism according to the rule) in 420 eyes. The vertical meridian was the least refractive (astigmatism against the rule) in 20 eyes. In 88 eyes the meridians were oblique. In 58 eyes the difference in the refraction of the two meridians was less than .25 D. In 101 eyes there was *emmetropia*. The largest number has a corneal refraction of from 44 D. to 45 D; the next largest from 43 D. to 44 D. The strongest corneal refraction was 47 D., the weakest 39 D. In 55 eyes there was *simple myopia*. The strongest refraction in the weakest meridian was 47.25 D.; the weakest 39 D. The corneal refraction did not in any considerable number of cases bear any close relation to the degree of the myopia. *Simple hypermetropia* was present in 59 eyes. Weakest refraction in the weakest meridian was 40.5 D.; the strongest 46 D. As in myopia, the corneal refraction was no indication as to the degree of general hypermetropia. *Myopic astigmatism* was found in 140 eyes. In 4 eyes the general astigmatism was greater and in 11 it was less than the corneal. In 14 eyes the difference in the axes of the corneal membrane and that of the prescribed glasses was greater than 5°. *Hypermetropic astigmatism* was present in 96 eyes. In 4 eyes the corneal astigmatism was greater and in 2 eyes it was less than the general. The axes corresponded in all but 9 eyes. *Compound myopic astigmatism* existed in 63 eyes. In all but 7 eyes the corneal and general astigmatism corresponded, and in 44 eyes the axes corresponded. *Compound hypermetropic astigmatism* was found in 55 eyes. In 31 corneal and general astigmatic meridians corresponded. The corneal and general astigmatism was the same in all but 4 eyes. *Mixed astigmatism* was present in 8 eyes. In 4 the corneal and general astigmatism was the same; in 2 the corneal was less and in 1 greater than the general. Corneal and general astigmatic meridians were the same in 5 eyes.

In 42 eyes the general astigmatism was against the rule, while in only 18 of *these eyes* was the corneal astigmatism against the rule. From examinations made under a mydriatic the author felt himself warranted in thinking that many cases of lenticular astigmatism are due to an oblique position of the lens.

Corneal astigmatism is, with very few exceptions, according to the rule (vertical meridian the stronger). From a study of these statistics the author feels warranted in concluding that, while the corneal refraction gives no indication of the general refraction of the eye, its astigmatism, in the vast majority of cases, expresses the general astigmatism both as to degree and direction of its and considers, therefore, the instrument of Javal and Schiotz one of, if not the most important instrumental means for the diagnosis of the anomaly. He does not think astigmatism more productive of progressive myopia than any other form of ametropia.

DR. H. D. NOYES, of New York: In the immense majority of cases the evidences of the ophthalmometer without the use of atropine have corresponded with the evidences of the trial case. The amount of astigmatism and in a general way the axis of the astigmatism is obtained. The use of this instrument has led me to believe that mixed astigmatism is more common than we usually imagine. I have also noted the influence of the eyelids in altering the curvature of the cornea. I have also satisfied myself that the tension of the eye muscles modifies the curvature of the cornea. I have also noticed in some cases a pulsation of the corneal reflex, due to the fact that the cornea was so thin that the circulation of the eye impressed itself upon it.

DR. SAMUEL THEOBALD, of Baltimore: I in-

fer that the author thinks that when a mydriatic is employed, the lenticular astigmatism is done away with. My experience leads me to believe that the asymmetrical condition in the lens does not at once disappear on paralysis of the ciliary muscle. I think that the discrepancy between the total and general astigmatism may often be accounted for by this persistent asymmetrical condition of the lens. This condition gradually disappears after suitable glasses are worn.

Progressive Hypermetropic Astigmatism was the title of a paper read by Dr. J. B. Emerson, of New York.

Dr. Edward Jackson, of Philadelphia, exhibited *A New Form of Cataract Knife.*

Dr. J. O. Tansley exhibited the following instruments:

1. *An Improved Lachrymal Syringe* in which the nozzle ends in a closed bulb, the openings being on the sides of the tube.

2. *A Clamp to prevent the passage of atropine solutions through the lachrymal duct into the nose* in cases in which the free use of atropine is called for.

3. *An Improved Lachrymal Probe, and Improved Stylus.*

Dr. Samuel Theobald exhibited *Probes made of Aluminium.*

Dr. Edward Jackson, of Philadelphia, read a paper on

Œdema of the Choroid and Retina.

The author reported the case of a young man struck in the eye with a marble or a small stone, causing a bruise of the eyeball. The ophthalmoscope showed localized swellings of the choroid and retina at the posterior pole of the eye; the choroidal spots having the usual grouping of ruptures of the choroid in this region. These spots disappeared in about a week. There was also at first some 0.75 D. myopic astigmatism, which gradually diminished and in three weeks entirely disappeared, leaving the sight perfect.

Dr. W. F. Mittendorf, of New York, read a paper on

Symptomatic Myopia.

Three forms of myopia may be spoken of: axillary, refractive and symptomatic. The latter form may be caused by traumatism, but more commonly by diseased conditions. It may be produced by displacement of the lens forward. More frequently it is due to swelling of the lens accompanying beginning cataract. This is sometimes relieved by the use of concave glasses; very strong glasses being occasionally required. Plastic exudations may also cause myopia, but these usually so interfere with vision that it is impossible to demonstrate the existence of myopia. Glaucoma, serous choroiditis and iritis are frequently accompanied with myopia as a symptom. A number of illustrative cases were cited. In these cases the myopia is not permanent, but as the disease disappears the myopia passes away, leaving the refractive condition of the eye the same as before the attack.

Dr. Carl Koller, of Vienna: I think that in these cases of myopia in iritis the condition may be due to the irritation of the ciliary muscle. There is hyperæmia of the ciliary body and, as the irides are contracted, it is to be supposed that the ciliary muscle is also contracted. Although atropine may be used there is not full dilatation of the irides. It is, therefore, reasonable to suppose that the myopia is a result of spastic contraction due to inflammation.

Dr. John Green, of St. Louis: In two attacks of iritis of which I was myself the subject, I carefully studied this myopia. In my case the eyes were completely under the influence of atropia. The pupils were dilated and the ciliary muscle paralyzed.

Evening Session.

Dr. William Oliver Moore, of New York, read a paper on

Hysterical Blindness in the Male, with a Report of Three Cases.

Case 1.—Male, æt. 25, farmer, family history good. During past two years had suffered with nervous symptoms. Did not smoke or drink. In June, 1886, complained of failing vision in left eye. When seen June 16, according to patient's statement vision in left eye = 0; in right eye normal. Ophthalmoscope showed normal fundus except a slight patch of opaque nerve fibre near the papilla. Testing with prism and candle gave double vision, as did pressure on one eyeball. The patient was informed that treatment by electricity would cure him in a few days. A severe faradic current was applied, causing the patient to jump from his chair exclaiming there already was improvement. In ten days V. = $\frac{2}{2}\frac{0}{0}$ emmetropic.

Case 2.—Male, æt. 22, student and farmer, fine-looking. History of insanity in the family. Eighteen months previous to coming under observation atropia had been instilled by a physician to determine whether or not glasses were required. He thought from the effect of the atropia that he was going blind. He then put on smoked glasses, subsequently bandages, and kept in a dark room. He would not open the lids and declared that he was blind. For ten months he kept in a dark room with covering over the eyes. On examination the lids were closed, but not by spasm; the cornea clear. V. = 0. Ophthalmoscopic examination under ether, normal fundus. Hysterical blindness was diagnosed and a favorable prognosis given. Canthoplasty was then performed. Coming from the ether the patient opened his eyes and evidently saw clearly. He was told that the cause of the disease had been discovered and that he would be well in a few days. In two days he

was walking around without glasses. Has remained well since.

Case 3.—Boy æt. 15. Developed blindness in right eye after a disappointment at school. Normal appearance of eyes. Tests with prisms and colored glasses showed that vision was present. Ether was administered and patient assured that he would be well, and under electricity recovery was rapid.

DR. CHARLES A. OLIVER, of Philadelphia, read a

DESCRIPTION OF A SERIES OF TESTS FOR THE DETECTION AND DETERMINATION OF SUBNORMAL COLOR-PERCEPTION (COLOR-BLINDNESS) DESIGNED FOR USE IN RAILWAY SERVICE.

It is a well-known fact, both from theoretical and practical standpoints, that many "color-blinds," especially those of medium grades, have the power of differentiation even by daylight of the most difficult colors, when placed at ordinary metre distance, of wool selection employed in the detection and determination of "color-blindness." The writer has been induced through a hope to overcome the dangers that might arise from this power in situations such as railways, marine and naval service, where the safety of lives and the protection of property is often dependent upon proper recognition of color at great distances, and frequently through the intervention of more or less translucent media, to combine two modifications of his method of color selection to a simplified plan of the former procedure by which the candidate is placed in the actual position of after-work and under exactly similar circumstances as during employment. The method is divided into three parts:

First. The selection and registry of a definite number of loose wools from twenty-three pure and confusion match skeins thrown upon a dead black surface at 1 metre distance.

Second. The selection and registry of the same number of similar reflected colors under various intensities of diffuse daylight stimulus, placed at distances requisite for safety.

Third. The selection and registry of transmitted colors under various intensities of artificial light stimulus placed at distances requisite for safety.

In addition to the advantages shown to refer to the first test alone, the method has the following additional ones: 1. Much faster in time than any other method. 2. The selection of loose wools at a distance. 3. No necessity for an expert except in doubtful cases. 4. Employment of the same character of signal for testing as is used in daily routine. 5. Placing the eye during testing at a distance necessary for future safety. 6. Bringing the eye during testing directly before the true condition of weather experienced whilst it is upon duty. 7. The test and match colors all graduated in proportionate sizes.

DR. CHARLES A. OLIVER also reported a

CASE OF EMBOLISM OF THE CENTRAL RETINAL ARTERY.

The patient, a young man, was seen October 5, 1887. Twenty-six hours previously, while slowly walking in the shade, he was suddenly seized with blindness in the left eye. There were no other symptoms, and there had been no previous illness. The right eye was normal. Ophthalmoscopic examination of left eye showed clear media; nerve substance of a gray tint, and swelling of the retina. All the retinal vessels were reduced in size. The veins were somewhat contracted, especially toward the nerve entrance. The characteristic cherry spot in the macular region was distinct. There was a small hæmorrhage out from the disc. Careful physical examination failed to reveal any lesion in other parts of the body. The case was kept under observation for some time, but there was no return of vision, the patient remaining completely blind in the left eye.

THURSDAY, JULY 19—SECOND DAY.

MORNING SESSION.

DR. SAMUEL THEOBALD reported

A CASE OF DOUBLE CONGENITAL IRIDEREMIA IN A CHILD WHOSE MOTHER EXHIBITED A CONGENITAL COLOBOMA OF EACH IRIS.

James O., æt. 18 months, was seen December 9, 1887. His mother brought him on account of the red appearance which the pupils presented. Upon examination, besides a congenital squint of the left eye, complete absence of each iris was discovered. The lenses were clear and there seemed to be, at least in the right eye, fairly good vision. The interest of the case lies in the fact, accidentally discovered, that there existed in the mother a congenital coloboma of each iris. In her right eye the coloboma was large, its direction being directly upwards; in the left eye it was somewhat smaller and was in an upward and outward direction. In neither eye was the choroid involved in the congenital defect. The mother volunteered the statement that an older child had had a similar appearance of the eyes, so that it is probable that to this mother with congenital coloboma there were born not only one, but two children with absence of the irides.

DR. T. Y. SUTPHEN, of Newark, N. J., read a paper on

PUNCTURE OF THE RETINA FOR DETACHMENT.

The results of three operations were reported. A male 62 years of age sought treatment April 1, 1887, for a cloudy appearance before the right eye. This he had noticed only a few days. He was

near-sighted but had never used glasses. Examination R. S. = $\frac{15}{100}$, raised to $\frac{15}{20}$ by — $\frac{1}{16}$. Field of vision defective downwards and towards the median line; tension slightly diminished. L. S. = $\frac{15}{100}$, raised to $\frac{15}{18}$ + by — $\frac{1}{16}$. Ophthalmoscope showed myopia with choroiditis in both eyes. In the right eye the retina was found detached in its upper and temporal portion. The patient refused to undergo vigorous treatment in bed. He was given iodide of potassium in gradually increasing doses, rest being enjoined.

Five months later the patient returned with commencing detachment in the upper and temporal portion of the left retina. He was then kept in bed for two weeks with the eyes bandaged, while profuse diaphoresis was frequently induced, but without benefit. He was then sent to the country, the iodide being continued. By December 1 there was in the right eye only perception of light; in the left there was vision confined to the outer and lower field. On this date puncture of the retina from beneath the detachment was made. Thorough antisepsis was employed; cocaine was instilled. A sickle-shaped needle was thrust into the globe between the insertion of the external and inferior recti muscles, on the equator and on a plane with the lens, it was pushed onward until it was thought that the retina had been pierced. It was then withdrawn with a sweeping motion, the object being to enlarge the opening in the retina. Atropine was instilled, the eyes bandaged, and the patient ordered to keep quiet. The following day the subretinal fluid had disappeared, field of vision was normal, a red reflex was obtained from the fundus in every direction and the patient could distinguish large objects. Bandage was reapplied. Two days later patient could count fingers at twelve feet, the retina appeared in its normal position, but the vitreous was quite cloudy. The vision continued steadily to improve. December 10 a similar operation was performed on the left eye. Two days later there was marked enlargement of the field of vision, but some detachment was still to be seen on the temporal side. December 16, field of vision in both eyes normal, no detachment of retina in either. The patient remained in bed twenty-eight days. February 10, detachment began to reappear in the left eye, and by March 3 it was as great as before. Needling was again performed with the escape of very little subretinal fluid. March 5, field again normal. April 1, partial return of detachment in left eye. July 6, seven months after first operation, S. R. = $\frac{15}{100}$, raised to $\frac{15}{40}$ by — $\frac{1}{16}$; no return of detachment, field of vision normal, blindness for red. In the left eye almost complete detachment of the retina.

After referring to the history of the operation, the speaker said that the interesting facts were these: The apparently perfect safety of the operation under modern antisepsis; one success and two failures under exactly similar conditions, barring the escape of the fluid outwards in the successful case; encouragement to try this operation in otherwise incurable cases; the absolute freedom from all reaction. The best results will probably follow when the operation follows closely upon the subsidence of the acute affection causing the detachment. The chances of success are increased by a free flow of fluid outwards. It was suggested that a narrow Graefe knife might be used after accurately measuring the depth of the detachment, provided the point be so directed that the wound in the retina shall be directly opposite the scleral puncture.

Dr. J. F. Noyes, of Detroit: I have tried operative procedure in only one case. I drew off the fluid with a hypodermic syringe. After drawing off the fluid the retina returned to its normal position and the outline of a small tumor was discovered. The detachment soon returned and the ball was enucleated one year later.

Dr. F. P. Capron, of Providence, reported

A CASE OF GLIOMA.

The patient was a child 3½ years of age. The growth was removed, but has since involved the submaxillary glands and the glands in the neighborhood of the ear.

Dr. David Webster, of New York: There is now on record a case in which Dr. C. R. Agnew removed both eyes of a child 1 year of age for glioma. This was fifteen years ago and the individual is still living. In this case the diagnosis was verified by microscopical examination. In some cases where the diagnosis was made and enucleation refused the patients are still alive and the disease has not progressed, retrograde metamorphosis having, it is said, taken place.

The President, Dr. W. F. Norris: My impression is that in true glioma, retrogressive metamorphosis does not take place. Fatty degeneration may occur in parts of the growth, but I am not aware of a case in which the growth entirely disappeared. Such cases are, I think, instances of mistaken diagnoses. The diagnosis is difficult unless the growth has reached such a size that the vessels may be seen in it.

Dr. Swan M. Burnett, showed

MODELS EXHIBITING REFRACTION BY CYLINDERS.

It was shown how the refraction and focal line change with the variation in the strength of the lens and with the alterations of the angle of crossing of their axes.

Dr. B. Alex. Randall, of Philadelphia, exhibited some drawings showing *Anomalous Outgrowths upon the Optic Disk*, and also drawings of *Anomalies of the Retinal Vessels*.

Dr. Edward Jackson proposed a

DESIGNATION OF PRISMS BY THEIR REFRACTIVE POWER.

The author pointed out the inconveniences and

errors arising under the present method of designating the strength of prisms and recommended their designation by their refractive power as much more accurate.

A committee, consisting of Dr. H. D. Noyes, Dr. Edward Jackson and Dr. Swan M. Burnett, was appointed to take the matter into consideration and report at the next meeting.

DR. DAVID WEBSTER, of New York, reported a case of

EXTRACTION OF A PARTIALLY ABSORBED CALCAREOUS LENS.

March 15, 1888, C. C., æt. 23, consulted Dr. Agnew and the author at the Manhattan Eye and Ear Hospital. She had phthisis bulbi, left, and in the right eye were the calcified remains of a motley absorbed lens, with a discolored atrophic looking iris attached to the membranous mass by numerous adhesions. Visual field good. V.= fingers at two feet. The vision of left eye had been lost through a blow with a whip at the age of 2 years. A catarrh developed in the right eye some time afterwards. Seven years ago (1881), her sight having been lost four months, both eyes were operated on, by a surgeon in another city, several times. Violent inflammation followed one or more operations on each of the eyes. Eighteen months ago another needling was done by another surgeon, by which sight was somewhat improved. The atrophic eye of late has been painful and tender on pressure.

March 16.—Dr. Agnew enucleated the atrophic eye-ball. A calcific plate was found in the choroid and a small calcareous lens. While the patient was still under ether, he did an iridectomy on the right eye.

April 27.—Dr. Webster divided with Knapp's knife-needle two or three of the adhesions which were on the stretch. At least one could be heard to snap when cut. An attempt to penetrate the thinnest looking portion of the membranous mass failed. There was considerable effusion of blood which was soon absorbed.

May 14.—An attempt to remove the papillary obstruction with a sharp hook failed. Very little reaction.

June 6.—With a keratome bent on the flat, a wound was made as for iridectomy on the superior nasal corneal border. The papillary obstruction was drawn out and cut off close to the cornea. Not a drop of vitreous escaped. There was some pain in the eye for three or four hours, probably the reaction from cocaine. Four days later pain again appeared and was relieved by iced cloths.

June 18.—Fundus normal. No floating bodies in the vitreous, but the remaining portion of the papillary membrane which, by the way, was very thick, and so tough that the iris scissors would scarcely cut it, extends backwards horizontally and flops up and down with the movements of the eye.

June 22.—V.=$\frac{20}{20}$ with —$\frac{1}{8}$. Reads Jaeger No. 1 with $\frac{1}{8}\frac{1}{25}+\frac{1}{8}\frac{1}{25}$.

June 26.—Discharged, wearing the above spectacles.

The following were elected

OFFICERS FOR THE ENSUING YEAR;

President—Dr. Wm. F. Norris, Philadelphia.

Vice-President—Dr. Hasket Derby, Boston.

Corresponding Secretary—Dr. J. S. Prout, Brooklyn.

Recording Secretary—Dr. Samuel B. St. John, Hartford.

It was decided to hold a special meeting for the consideration of scientific matters only, Sept. 19, 1888, at the Arlington Hotel, Washington, D. C.

The regular meeting will be held the third Wednesday in July, 1889, at the Pequot House, New London, Conn.

Adjourned.

Philadelphia County Medical Society.

Stated Meeting, May, 23, 1888.

THE PRESIDENT, J. SOLIS COHEN, M.D., IN THE CHAIR.

DR. JOSEPH O'DWYER, of New York, read a paper on the use of

INTUBATION TUBES.

[Before reading his paper Dr. O'Dwyer exhibited tubes with a metallic attachment to replace the epiglottis in swallowing, one of them being so arranged with a spring that the finger might be introduced behind it as extractor. In order to illustrate through how small a space breathing can occur, he exhibited a specimen from a case in which there had been no choking of voice or other sign of laryngeal involvement. Many fear that the tube will slip through into the trachea. A tube was exhibited *in situ*, in a 3-year old larynx, showing that this accident cannot occur if the proper size of tube for the age be employed.]

The testimony of tracheotomists from the time of Bretonneau, has been uniformly in favor of canulas of large calibre. I will refer to a few of the authorities on this subject before giving the reasons that led to the adoption of laryngeal tubes of so much smaller calibre than those generally used in the trachea.

If a large opening be preferable in one situation it certainly is in the other, the same arguments applying to both. Bretonneau for some reason that I have not been able to find, came to the conclusion that the canulas which he first devised were not large enough, and laid down the rule that: "The artificial conduit should always have at least the normal diameter of the

glottis of the subject." Trousseau endorsed this as an excellent precept, which should never be forgotten. Steiner says that as large a canula as possible should be used.

The first point of importance insisted on by West, as influencing the result of tracheotomy in croup, is the use of a large canula. The author of the article on croup in Holmes's *System of Surgery* says that:

"As a general rule, both openings in the canula should be sufficiently large to admit as much air as would pass through the rima glottidis in health.

The following is from Reynolds's *System of Medicine*: "No tube with less than a quarter of an inch in diameter is sufficient to carry on respiration. At a year old such a tube cannot be introduced into the trachea; it would not be tolerated at 2 years old, so that at these ages some other means must be looked for to secure a passage for the air." This author then discusses the question as to whether the want of success with tracheotomy in very young children is not due to the inability to secure a large enough opening.

In answer to such assertions as the above, it is only necessary to state that the diameter of the lumen of the trachea at a year old is scarcely a quarter of an inch, and, furthermore, an adult can breath comfortably while at rest through an opening of this size. I have at present a man under my care who has been wearing a canula in the trachea for the last seven months, the bore of the inner tube being exactly one-fourth of an inch in diameter. During part of this time he was obliged to breathe exclusively through the artificial opening, but then the least exertion, such as walking across the room, was sufficient to induce dyspnœa. Nature supplied this patient, who is of large stature, with a breathing tube at least seven-eighths of an inch in diameter, and the surgeon substituted one having a breathing capacity of something less than one-twelfth of this. In other words, the area of a cylinder seven-eighths of an inch in diameter is a little more than twelve times that of one a quarter of an inch in diameter.

I have found that in the adult the diameter of the lower division of the larynx is from one-eighth to three-sixteenths of an inch less than that of the trachea, which reduces the breathing capacity about one-third. I have not made any similar measurements in children, but by comparing a section from the cricoid cartilage placed beside one from the trachea, it does not appear that the area of the former is more than one-half that of the latter; in other words, the disparity is greater in children than in adults. In the preceding calculations I estimated on the size of the trachea, simply because it was more convenient, but it is evident that in order to arrive at correct conclusions, we must compare the lumen of the canula with that of the infraglottic division of the larynx, because the trachea would conduct air to and from the lungs just as well were it no larger than its mouth. But, as I have already stated, it was not from any such comparisons with the normal calibre of the larynx that the tubes have reached their present dimensions, but from noting the results of pressure on the intensely inflamed and infiltrated tissues as found post-mortem.

After an experience with tubes of various sizes in over two hundred cases of croup, besides other forms of stenosis in children, I am fully convinced that, as at present constructed, they afford ample room for carrying on the respiratory function in the most perfect manner. When the disease is confined to the larynx and upper portion of the trachea, it is not an uncommon experience after the paroxysm of coughing that immediately succeeds intubation has subsided, to find the little patient breathing so quietly and imperceptibly that it is sometimes difficult to convince the mother, who has returned to the room after an absence of fifteen or twenty minutes, that her child is still living. Such complete freedom of respiration would be impossible were the opening too small. When the struggle for breath has continued long enough to produce extreme exhaustion, together with more or less atelectasis and congestion of the lungs, this perfect relief does not occur. The same is true after the partial asphyxia induced by prolonged or repeated attempts to insert the tube. Such cases sometimes never rally, although air enters the lungs in the freest possible manner. If any dyspnœa whatever remain for any considerable time after intubation, or if the respiration be much above the normal in frequency, it indicates the presence of some complication or extension of the disease below the tube. The fact that several times on removing a tube from the larynx I have found its calibre considerably reduced by firmly adherent secretions, when there had been no dyspnœa to indicate it, is good evidence that there is more room than is actually required for the free entrance and exit of air.

Physiology teaches us that the muscular system is the great consumer of oxygen, and that when this system is at rest the consumption of oxygen is reduced to a minimum. It has been estimated that as much oxygen is consumed during one hour of active exercise as would suffice for four hours in a state of repose, with food, and for six hours without food. On purely physiological grounds, therefore, if only one-fourth or one-sixth of the amount of air is required in a state of rest, a canula bearing this proportion to the normal lumen of the air passages should afford ample room for the perfect performance of the respiratory function without the least effort whatever. There would be no point in trying to determine through

just how small a fraction of the normal lumen of the air-passages it is possible to carry on respiration effectually, if the only object to be accomplished by the artificial channel were to allow the free passage of air to and from the lungs. There would then be no room for argument, as there could be no objection to having the canula many times larger than necessary for this purpose, for such exists in the normal condition. I will add further, that were there no abnormal secretions to be gotten rid of, there would still be no reason for difference of opinion on this question.

The only ground left for argument, therefore, is the manner in which the machinery concerned in the removal of secretions is modified or injured by a canula in the larynx or trachea.

The mechanism of coughing, as I understand it, is simply getting as much air into the lungs as possible, condensing it, and allowing it to escape suddenly, on the same principle as the air-gun. To accomplish this, the glottis is firmly closed, coincidently with spasmodic contraction of the expiratory muscles, until the imprisoned air is sufficiently compressed, not only to give it power to project any offending substance before it like the ball from an air-gun, but also to increase the friction between it and the lining membrane of the air-passages to such a degree as to scrape off, so to speak, secretions that may be adherent. Considerable condensation, with great velocity of the expired air are, therefore, necessary to give the maximum expulsive power. The latter without the former would accomplish nothing, because the same volume of air can be driven through the open or half-open glottis just as rapidly as in the act of coughing, without the least power to remove a particle of mucus even from the larynx, much less from the bronchial tubes. This can be demonstrated by trying to cough while retaining the vocal cords in the expiratory position—the lack of power resulting solely from inability to compress the air to any appreciable extent.

Coughing through a canula is identical with this act when performed with a partially open glottis, and the only means left of subjecting the air to any condensation whatever is the much shorter time occupied in expelling it through the same space by which it more slowly entered. An excellent and forcible illustration of this argument, and one the mechanism of which is identical with that of coughing, is the familiar act of blowing the nose. There is little or no ability to remove secretions from this organ without first reducing the nostrils to a small fraction of their normal calibre, or by momentarily producing complete occlusion, as in closing the glottis, until the air is sufficiently condensed to force the secretions out with it. Very little power can be developed even by closing one nostril and forcing all the air through the other, if normally patulous. If secretions can be removed more effectually from the air-passages through a canula of the dimensions advocated by the authorities already quoted, for the same reason it should be easier to remove accumulations from the nose without compressing the nostrils. I claim, therefore, that while the artificial opening must be large enough for the perfect performance of the respiratory function, the power to expectorate is still further diminished, and in exact proportion to its increase beyond this limit.

DR. CARL SEILER: I see that Dr. O'Dwyer has added an artificial epiglottis to the tube. It has been the experience of all laryngologists to meet with cases of complete or almost complete destruction of the epiglottis by syphilitic or other ulceration, in which there has been no difficulty of deglutition at all. Therefore, I long ago came to the conclusion that it is not the epiglottis which protects the larynx, but the apposition of the ventricular bands. And I would suggest, though I have no experience with such a device, that if the tubes were so made that the head could slip into the ventricles of Morgagni without interfering with the ventricular bands, there would be no difficulty in deglutition experienced. It is not only in New York, but also in this city that the only operation for opening up the air passages that parents will consent to is intubation. I recall a very distressing case in an asylum, in which the matron would not consent to tracheotomy until the mother of the child had been communicated with, and while they were hunting the mother the child choked to death. This was before we knew of intubation. That we might have performed at once.

DR. H. R. WHARTON: As to the calibre of the tubes, the fact that children do breathe well with tubes as now made is sufficient evidence of the correctness of Dr. O'Dwyer's position. Since my experience of this, I am not so anxious as formerly to get in the largest tracheotomy tubes.

DR. E. E. MONTGOMERY: Since August, 1886, I have performed some thirty or forty intubations, having previously done some twenty-eight tracheotomies. Fifty per cent. of the children intubated have recovered. My experience is that this operation largely reduces the necessity for tracheotomy, and I believe that if intubation were done early in every case, tracheotomy would rarely be necessary. I cannot refrain from saying that I feel that in devising and perfecting his operation, Dr. O'Dwyer has been a benefactor to the medical profession and to the human race.

DR. SHIMWELL:. I have performed intubation sixteen times with seven recoveries. In all there has been immediate relief to respiration. In one case I had to remove the tube twice, and introduce it three times, and perform artificial respiration. In removing the tube post-mortem, I have found it impossible to drag it down through the trachea, so there is no danger of slipping. Is not

the occurrence of substernal respiration-depression rather too late an indication to wait for?

THE PRESIDENT: I am glad to thank Dr. O'Dwyer for his lucid exposition founded on fact, and proved by actual exhibition of specimens, that the small calibre of his intubation tube is amply sufficient for due respiration. My own experience with tracheotomy has led me to favor large tubes, the largest that can be introduced without touching the walls of the trachea. I still believe that I have seen life saved by taking out small tubes and substituting larger ones. And I confess that the small calibre of the tube used was one of the theoretical considerations which I enumerated among the drawbacks to intubation. But facts are stronger than theories, and as the small calibre intubation tube does seem to give air enough, and as enough is all that is wanted, I am quite ready to profess my satisfaction with its present calibre. I must ask Dr. O'Dwyer to make clear to us the question as to the impaction of membrane. This is not a mere theoretical objection, but is borne out by experience. Perhaps I have been led to attach an undue importance to the matter by an accident which occurred to me a year or so before Dr. O'Dwyer read his now historical paper before the International Medical Congress at London in 1881. I had been called to a case of membranous laryngitis, and had proposed tracheotomy, which had been declined. As I turned to leave the room the mother called piteously, "Oh, doctor, don't leave my child without trying to do something for it." I said to my assistant, "We will try to save this child," and taking a catheter I cut off the end, and passed the instrument into the larynx. The child instantly became black in the face, and there was nothing for it but, without asking any questions, to plunge my knife into the trachea as the child lay on its mother's lap. I inserted the same catheter through the orifice deep into the trachea, and then we performed artificial respiration, my assistant inflating the child's lungs through the tube with his own breath, and my hands exercising compression of the thorax in respiratory rhythm; and, after a while, we had the satisfaction of leaving the rescued child sleeping peacefully with unobstructed respiration. But I confess that this experience cost me some of the most anxious moments of my life, and has left a fear of the danger of crowding down membrane in front of a tube introduced into the larynx which may, perhaps, make me over-anxious.

DR. O'DWYER: Pushing down of membrane does occur, though rarely. The difference betwen the liability to the accident in catheterization and intubation is that the catheter has an open, comparatively broad end, while the intubation tubes are comparatively probe-pointed. One pushes and catches the membrane, the other slides past it. I have crowded membrane down in only two cases out of two hundred sufficiently to produce asphyxia. In those two, on removal of the tube, the cast was coughed out.

If we take away the tube because the child is breathing badly and the trachea is full of membrane, the child not having the strength to cough it out, the child chokes from the absence of the tube, not from its previous presence. My attention is now being directed to devising a means to get rid of the membrane. I hope to present something practical before long.

Blocking with membrane while the tube is in may occur. Formerly, when the swell of the tube was not so great, it would be coughed out, but now it is not coughed out and suffocation may take place. The original tube was better in this regard.

The earlier tubes were made to fit into the ventricles with the idea of permitting the approximation of the ventricular bands, but it did not work. It is true that the epiglottis is merely an accessory, but in an intubation case, the ventricular bands being held open, we have to depend upon it; and that is the reason, the dependence being a poor one, that solids and semi-solids which can go down in mass are better than liquids.

DOMESTIC CORRESPONDENCE.

A Few Drops at a Dose.

Dear Sir:—Your editorial headed "About the Size of a Bean," in THE JOURNAL for May 26, is very timely and to the point.

Manufacturers of patent and proprietary remedies, as well as the druggists, are also guilty of using very indefinite directions for the administration and preparation of medicines. The label for one of the popular cough preparations states that the dose is a "few drops." Now who knows how many make a few? If the patient has just been taking tincture of iron in five-drop doses then two or three would be considered a "few," but if some mixture has been previously administered in forty or fifty-drop doses a "few" might be construed to mean twenty or thirty drops. Another manufacturer of remedies for the cure of all human ills instructs his patrons to take a teaspoonful "several times a day." Previous experience may cause one person to consider three to be "several" while others may take twenty doses a day. These cases of carelessness on the part of manufacturers might be multiplied, but they are sufficient to illustrate the point. Practicing physicians should bear this state of affairs in mind when called to see patients that make a drug store of their stomach.

The retail druggist is also sometimes guilty of giving careless directions. Customers sometimes

ask for information about doses, or how to prepare decoctions, infusions, poultices, etc. I have heard such indefinite measures as a "handful," "pinch," "a little," "swallow," "gulp," "sip," "mouthful," "bowlful," "small quantity," etc., used in imparting such knowledge. Our drops, teaspoons, dessert-spoons, table-spoons, teacups, tumblers, wine-glasses, etc., vary sufficiently to cause trouble without making use of such vague terms as I have mentioned.

H. M. WHELPLEY.

St. Louis, Mo.

Tympanitis and Tympanites.

Dear Sir:—Your late reference to the frequent use of the word tympanitis for tympanites, suggested a few reflections on the subject of careless expressions by medical writers. It seems to me, however, that you have been unfortunate in the one example which you have selected for animadversion. Whenever I have seen one of the spellings in question, where the other ought to have been used, I have regarded it as a typographical error which had escaped the proof-reader. But suppose, for example, the misspelling to have been in the copy, should not the compositor have corrected it? If, however, he failed to do so, was it not the duty of your proof-reader to preserve THE JOURNAL from such a blemish? Some pretty well educated doctors are careless writers. Is it customary for the better journals to reproduce all their accidental faults?

If 'twere possible always to regard the error as a fault of the printer I would not not trouble you with this note. How often do we see the terms vaccinate and inoculate used as if they were synonomous. In records of cases we meet every day with the expressin "the pain disappeared." Of course it is too much to expect of the publisher that he should correct all the defects of a radically bad composition, but when, as in the instance to which you refer, it is the use of an *i* instead of an *e*, the profession will hold him responsible.

Sincerely, ...

[We selected the misuse of tympanitis for tympanites for animadversion because it is frequent, both in authors' mss. and in medical literature, and because in one case after the correction had been made the author changed it in his corrected proof. It is the editor's, not the compositor's or proof-reader's, duty to correct misspelling of technical words, and this should be done before the mss. is given to the compositor.

Medical men are very jealous of having their mss. corrected or changed in any way, and frequently complain of changes, even when they are made in the interests of grammar and common sense.

What is the objection to the expression, "the pain disappeared?" One of the meanings of "to disappear" is "to cease to be or to exist."

While on this subject, we beg to call our correspondent's attention to some words and expressions in his communication. " . . . in the one example which you have selected," should read "in the one example that you have selected," if a relative word be used at all. " . . . where the other ought to have been used," should read "where the other should have been used." *Ought* implies *moral* obligation.—EDITOR.]

MISCELLANEOUS.

TEACHING IN THE LONDON HOSPITALS.—Dr. George J. Preston, of Baltimore, writes to the *Maryland Medical Journal*: The Continental schools have held out so many and varied attractions to the student of medicine, and the prevailing fashion has set so steadily in that direction, that comparatively few Americans are found in the hospitals of London. This is to be regretted for several reasons, the most important being, that we in America are in need of the painstaking, thorough, clinical work that is so characteristic here. Then, too, no time is lost in becoming accustomed to a foreign language, as on the Continent. Of course there are disadvantages. There are very few private classes or courses given here, and the foreign student is not given the prominence that is awarded him in Vienna, for example. The teaching is intended, as it should be, for the English student. I have heard of some complaints from German students, that more attention is shown to foreigners in many of their Universities, than to their own men. On the other hand nothing could exceed the courtesy that is extended to a visitor in the London Hospitals. Everything is open to him, and he is free to attend any clinic or lecture he wishes to avail himself of. The thing that impresses one most in regard to the work here, is the minuteness with which the clinical examinations are made. The teaching is done not by lectures, or, at least, very little in this way, but in the wards. The students are taught to take the histories of the cases, and the chief carefully goes over each case, pointing out characteristics and peculiarities, and directing the examinations which each student makes for himself. My attention has been directed chiefly to neurology, for which London offers special advantages, both in the amount of material and the eminent specialists. At the National Hospital for Paralysis and Epilepsy, there are from 250 to 300 beds, and very large out-patient departments. It is the centre for this special work, and is admirably fitted to carry it on. Dr. Gowers, whose recent book is in most respects the best systematic work on nervous diseases that has appeared, holds a very large out-patient clinic every Mondy at the National, and his well-earned reputation has attracted students of nearly all nationalities to him. This clinic lasts from two to three hours, in the course of which almost the whole field of neurology is illustrated. The work is mostly diagnostic and physiological; treatment has not a very prominent place, except an outline of it, nor is pathology made as much of as in many of the clinics in America. This fact has impressed me also in the clinics in general medicine. One does not hear very much about pathology, except in the lecture on that special subject, or in the dead house. The clinical teaching is essentially diagnostic.

ORIGINAL WORK AT THE THOMAS WILSON SANITARIUM.—The noble work of this Institution among the children of the poor has been resumed during the present summer with renewed vigor. As many as ninety sick children, most of them ill with summer complaint, are taken early each morning, free of charge, to the Sani-

tarium, and brought back to the city late in the afternoon. At the Sanitarium simple food is provided freely for all, and the mothers and children spend the day in its pleasant halls and grounds. Those who go for the day, only, take with them their own medicines, and special caution is used that the directions of their family physicians shall not, except in emergency, be interfered with.

The subject of greatest interest is the treatment of those children who are allowed to remain for several days or weeks in the cottages, under the care of the physician in charge, Dr. Booker, and of the resident lady physicians. Two of these cottages contain twelve rooms, each with a bed and a cot, for mothers who can remain with their children; the third has a nursery of eight cots, in which children may be left, in charge of two competent nurses, by mothers who must go to the city, and who are furnished with tickets so that they may return to the sanitarium whenever they wish. Severe cases of summer complaint are benefited only by several days stay in the country. The treatment of the cottage children is very simple and worthy of adoption in private practice. In acute diarrhœa with vomiting of milk, the child is at once taken from the breast or bottle, and no food except beef tea is given to it for twenty-four hours. Small doses of calomel—1-12 to 1-6 grain—are administered hourly for a day or two, to quiet the stomach and to excite the secretion of the liver. At the end of twenty-four hours *sterilized milk* is given. If the vomiting returns the milk is stopped and beef tea is resumed for twenty-four hours, when milk is once more given.

No artificial foods are used in the Sanitarium. Irrigation of the lower bowel is practiced two or three times a day, if it does good. In chronic cases resorcin grs. ij with tr. opii deodorata gtt. ½ is given every two or four hours. When vomiting proceeds from nervousness, sodii bromidi grs. ij and chloral hydrate gr. j are administered every two or four hours to a child of six months. This same prescription is used for sleeplessness. As a rule no further medication is needed.

Dr. Booker considers the *sterilization of the milk* a great improvement, likely to do away with wet-nursing and artificial foods. Milk as it flows from the breast is free from microscopic germs. Between the time when the cow's milk leaves the rubber and the time when the baby drinks it various minute organisms may fall into it, which, either before or after the child takes it, produce changes in the milk which cause disorder of the digestive organs of the child.

By *sterilization* we either destroy these organisms or check their growth. The apparatus for sterilization is a covered tin bucket ten inches in height by eight in diameter and a wire basket made by Dufur & Co., of Baltimore, large enough to hold six or eight nursing bottles. In the bucket filled to the depth of one inch with hydrant water, is placed the wire basket with the nursing bottles, each of them containing a suitable amount of milk and stopped with a wad of cotton batting. The bucket is then covered and placed on a gas stove, and the water is boiled for half an hour, the milk, bottles and stoppers becoming sterilized by the heat. After cooling the basket of bottles is kept in a cool place, and one by one, as needed, the bottles are removed, the stoppers taken out, and a disinfected nipple is attached for nursing. Milk enough to supply one baby for twelve hours is thus prepared at once, and if kept in a cool place—even without ice—it will remain sweet and wholesome until used. The whole apparatus, including bottles, costs a little more than a dollar.

It is stated by Dr. Booker that when the infant's bowels have once been cleared of ill-digested milk by change to beef tea and by irrigation, the use of sterilized cow's milk properly diluted is followed immediately by great improvement in the health of the infant, as great as when it returns to the breast of its mother.

For irrigation of the bowels a fountain syringe full of tepid hydrant water is connected with a soft rubber catheter about fourteen inches long, and this catheter, oiled, is passed gently to its full length into the rectum and descending color, the water—a gallon or more—being allowed to follow into the bowel and out again by the side of the catheter. This irrigation is painless and often aids greatly in recovery, especially in severe cases resembling cholera infantum.—*Maryland Medical Journal*, July 14, 1888.

THE METHOD OF DISINFECTION PRACTICED AT THE QUARANTINE BELOW NEW ORLEANS.—No scientific report published by the Government this year has been more important than that just made by Dr. J. J. Kinyown, assistant surgeon in the Marine Hospital Service (*Weekly Abstract*, June 29), upon the germicidal powers of the different methods of disinfection practiced under the direction of the Louisiana Board of Health at the quarantine station below New Orleans. The report is important, not only because it shows the degree of protection against the importation of infectious diseases through the important port of New Orleans, but also, since the methods of disinfection practiced at other quarantine stations are similar to those in use there, the experiments show approximately the efficacy of each mode of disinfection, and suggest changes that should be made in their use.

The three methods of disinfection tested were: the use of bichloride of mercury solution, the application of dry and moist heat and fumigation with sulphur dioxide.

Dr. Kinyown finds the first of these methods defective, because of the difficulty of getting the disinfecting agent into cracks and corners, rubber goods, the under sides of decks, and into lockers, etc. He discovered in all these localities and articles that the microörganisms existing before the disinfection had not been destroyed, and he found them as plentiful on the floor of the forecastle of one ship, that was exceptionally filthy, after it had been drenched with bichloride of mercury for an hour, as before. Dr. Kinyown recommends that, in order to make this mode of disinfection more effectual, the bichloride of mercury be applied with a spray produced by connection with a steam-boiler, and that it be applied after fumigation by sulphur.

The results from the application of dry and moist heat were the most satisfactory of all. Cultivations of various disease-germs exposed to a dry heat of 176° F., and afterward to steam at a temperature of 212 ° F., were, with few exceptions, destroyed. Dr. Kinyown thinks that, in order to secure absolute protection, the heat should be made greater and the time of exposure increased.

In eleven experiments seventy-four disease-germs were placed in vessels among articles to be disinfected by the use of sulphur dioxide, but only sixteen of the whole were destroyed, or less than 22 per cent. Dr. Kinyown has very little to say about this method of alleged disinfection, except to recommend that the sulphurous fumes be applied in large quantities, and be confined in the compartments to be disinfected a longer time. But he reports his experiments in full, and lets them speak for themselves.

The net result of these tests is to show that some disease-germs escape even when the most effectual modes of disinfection practiced at quarantine below New Orleans are resorted to, and that less than one-fourth of them are killed when the least effective method is used. We assume that the quarantine and city health officers everywhere will profit by the suggestions of this report, and that the public will be better protected in the future than in the past.—*Science*, July 13, 1888.

THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.—The Committee of Arrangements takes pleasure in announcing to the members and invited guests of the special societies taking part in the Congress that the arrangements are sufficiently advanced to assure the success of the First Triennial Session of the Congress of American

Physicians and Surgeons, which will be held in the city of Washington, during the 18th, 19th, and 20th of September next.

A number of distinguished physicians and surgeons have signified their acceptance of the invitation to attend, among whom may be named Sir Spencer Wells, Sir Andrew Clark, Sir William McCormac, Drs. W. O. Priestly, William Ord, and Grainger Stewart, Mr. Lawson Tait, Mr. Victor Horsley, Mr. Thomas Bryant, Mr. Thomas Annandale, Professors Ferrier, Esmarch, and Gerhardt, Drs. Rafael Lavista, of Mexico; J. L. Reverdin, of Geneva; O. W. Holmes and H. J. Bowditch, of Boston; Joseph Leidy, of Philadelphia; W. Kingston and Eccles, of Canada.

The meetings of the Congress will be held during the evenings, beginning at 8 o'clock, P.M.; on the evenings of the 18th and 19th the meetings will be held in the main hall of the Grand Army Building, 1412 and 1414 Pennsylvania Avenue, and on the last (Thursday evening) in the hall of the National Museum. During this evening the Army Medical Museum and Library building, along side of the Museum building, will be lighted and opened for the inspection of the members and invited guests. The meetings of the societies will be held during the day, according to the programme each may respectively provide. The sessions will be open to the profession.

On Monday evening, September 17, a dinner will be given by members of the Congress to the guests of participating societies. Invitations to this dinner will be sent only to the specially invited guests who have indicated their acceptance. The contributing members will receive cards of admission. It will be limited exclusively to members of the Congress and invited guests. An informal collation will be served at Willard's Hotel on Tuesday evening, after the adjournment of the meeting of the Congress, to the guests and those members who may choose to attend. A similar entertainment will be served in the National Museum building on Thursday night, after the final adjournment of the Congress.

Guests are requested to notify the Chairman immediately after their arrival in Washington, giving their address and stating whether they have ladies with them. Special arrangements will be made for the entertainment of the wives and daughters of the guests. Hotel accommodations are ample, and conveniently located to the places of meeting.

The Secretaries of the special societies are requested to forward to the Chairman the names and addresses of their foreign guests.

Members of the Congress and the guests are expected to register. A parlor in Willard's Hotel will be provided for that purpose, from which the mail of the members and guests will be distributed, and at which the city residence of each member or guest can be ascertained. All communications should be addressed to the Chairman of the Committee.

SAMUEL C. BUSEY, M.D.
Chairman Committee of Arrangements.
1545 I St. N. W., Washington City.

RECORD AND CLASSIFICATION OF CONTINUED AND REMITTENT FEVERS.—*To Medical Officers and Acting Assistant Surgeons, U. S. Marine Hospital Service.*—With a view of formulating a more precise symtomatology of the "continued" and "remittent" fevers; from and after July 1, 1888, you are directed to take full and accurate notes of all cases of "continued" and "remittent" fevers treated by you among patients of the Marine Hospital Service, and to make special semi-annual reports of all such cases to this office.

The cases of fever should be classified, as far as practicable, according to the symptoms in each case, into simple continued, enteric, remittent, etc., and every symptom noted.

The presence or absence of the following symptoms relative to enteric fever should be carefully noted, together with the dates of their respective appearance:

Eruption; Diarrhœa; Tympanites; Intestinal Hæmorrhage; Perforation of Intestines; Peritonitis; Necropsy; Temperature Range; Enlargement of Spleen; Delirium (character); Mode of Onset (gradual or sudden), Presence or Absence of Initial Chill; Presence or Absence of Intestinal Lesions, and, if present, give exact location.

JOHN B. HAMILTON, *Supervising Surgeon-General.*

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from July 27, 1888, to August 3, 1888.

Surgeon D. L. Magruder, U. S. Army, is granted one month's leave of absence, to take effect on or about August 13, 1888. Par. 11, S. O. 171, A. G. O., July 25, 1888.

Major Richard S. Vickery, Surgeon U. S. Army, leave of absence extended two months. S. O. 166, A. G. O., July 19, 1888.

Surgeon Robert H. White, U. S. Army, is relieved from duty with battalion First Infantry at Santa Barbara, Cal., and will proceed to Angel Island, Cal., on public business, on the completion of which he will stand relieved from duty in this department. Par. 4, S. O. 43, Hdqrs. Dept. of Cal., July 17, 1888.

Asst. Surgeon Curtis E. Munn, U. S. Army, will proceed to Santa Barbara, Cal., and report to commanding officer of the First Battalion of Infantry for duty. Par. 3, S. O. 43, Hdqrs. Dept. of Cal., July 17, 1888.

Asst. Surgeon John J. Cochran, U. S. Army, will proceed to Benicia Bks., Cal., on public duty, on completion of which he will return to these Hdqrs. Par. 1, S. O. 44, Hdqrs. Dept. of Cal., San Francisco, Cal., July 20, 1888.

Asst. Surgeon Reuben L. Robertson, U. S. Army, is relieved from duty at Ft. Keogh, Mont. Ter., and will report to the commanding officer at Ft. Buford, Dak., for duty at that post, and by letter to the commanding general, Dept. of Dak. S. O. 161 A. G. O., July, 20, 1888.

Asst. Surgeon N. S. Jarvis, U. S. Army, is granted one month's leave of absence, on surgeon's certificate of disability, with permission to go beyond the limits of the Department. Par. 1, S. O. 90, Hdqrs. Dept. of the Missouri.

Capt. Henry Johnson, Medical Storekeeper, U. S. Army, leave of absence granted for one month and fourteen days, from August 1, 1888. S. O. 170, Hdqrs. of the Army, A. G. O., July 24, 1888.

Official List of Changes in the Medical Corps of the U. S. Navy for the Week Ending July 28, 1888.

Surgeon Thomas N. Penrose, detached from Navy Yard, Boston.

Surgeon J. B. Parker, ordered to the Navy Yard, Boston.

Albert McD. McCormick, commissioned Asst. Surgeon in the Navy.

Official List of Changes of Stations and Duties of Medical Officers of the U. S. Marine Hospital Service, for the Two Weeks Ending July 28, 1888.

Surgeon R. D. Murray, to proceed to Manatee, Fla., on special duty. July 21, 1888.

P. A. Surgeon Eugene Wasdin, to proceed to Key West, Fla., for temporary duty. July 21, 1888.

Asst. Surgeon J. B. Fattic, to proceed to Memphis, Tenn., for temporary duty. July 28, 1888.

Asst. Surgeon R. M. Woodward, when relieved, to proceed to Boston, Mass., for duty. July 24, 1888.

Asst. Surgeon H. T. Goodwin, when relieved, to proceed to Cincinnati, O., for duty. July 24, 1888.

Asst. Surgeon G. M. Guitéras, appointed an Asst. Surgeon July 23, 1888. Assigned to duty at Marine Hospital, New Orleans, La. July 24, 1888.

Asst. Surgeon S. H. Hussey, appointed an Asst. Surgeon July 23, 1888. Assigned to duty at Marine Hospital, Baltimore, Md., July 24, 1888.